

THE IRON AGE

THURSDAY, SEPTEMBER, 6 1888.

SPEECH RECORDERS AND REPRODUCERS.

For years the registering and reproducing of sound by mechanical means have been subjects of interesting study, the prosecution of which has finally given results promising to be of direct commercial value. There are undoubtedly some among our readers who remember the first measurable successful attempt in this line made public about ten years ago, the apparatus used being the Edison phonograph,

ferred the sound vibrations of the disk. A series of indentations were thus produced on the tinfoil, which, being a non-elastic substance, retained them. If now the part which the mouthpiece played was reversed, the indented tinfoil could be used to reproduce the sound. This was best effected by a special mouthpiece of larger size, with a diaphragm of similar construction. This was so adjusted that the point was made to work along the indentations, setting the diaphragm in vibrations, which, being communicated to

a number of experimental stages. In its present shape it gives every promise of meeting the requirements of a practical substitute for a stenographer, taking dictations as readily and, in fact, more accurately and reproducing them for transcription by typewriter or other means when required. For this purpose it will shortly be offered to the public. The main principle of Mr. Tainter's phonograph-graphophone is the same as that underlying Mr. Edison's improved apparatus, though in detail the two differ, as will be

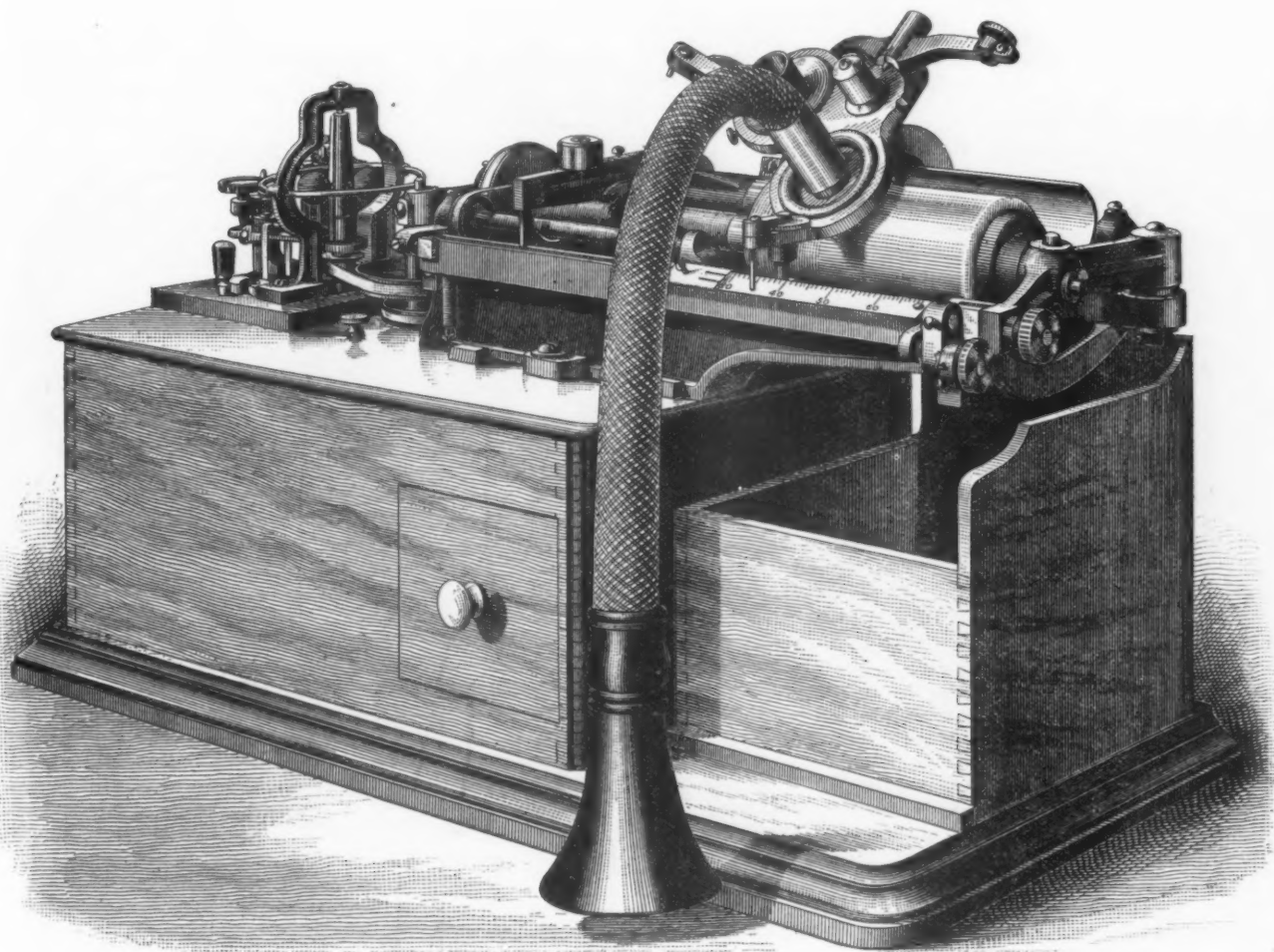


Fig. 1.—The Edison Phonograph.

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to descriptions of which it is of some interest to refer at the present time. Compared with what has more recently been accomplished, this original machine appears as a rather crude device, though the character of the results which it yielded was striking and the mechanism exceedingly simple. Briefly described, it consisted of a cylinder coated with tinfoil, and so mounted in a frame that by means of a crank and screw a rotary and at the same time a longitudinal motion could be imparted to it. The sound to be recorded was directed into a mouthpiece closed by a thin elastic metal disk. By means of a spring a small steel point, rounded at the end, was fixed to the back of the disk and pressed gently against the surface of tinfoil, to which it trans-

ferred the sound vibrations of the disk. A series of indentations were thus produced on the tinfoil, which, being a non-elastic substance, retained them. If now the part which the mouthpiece played was reversed, the indented tinfoil could be used to reproduce the sound. This was best effected by a special mouthpiece of larger size, with a diaphragm of similar construction. This was so adjusted that the point was made to work along the indentations, setting the diaphragm in vibrations, which, being communicated to

The engravings which we give in this issue, however, show the latest and most improved form of the phonograph, which, as may be readily imagined, passed through

seen later. At present there are in existence only a few of Mr. Edison's phonographs of the latest type, and we were kindly given opportunity to examine, photograph and sketch one, and are thus enabled to first present it to our readers. It is in this form that it will be offered for public use. The general view will show at once that important modifications have been made. To begin with, in the later instruments, as in this one, the recording cylinder coated with tinfoil has been superseded by one of hardened wax. This is slipped over a mandrel mounted on a spindle which at the opposite end is threaded and rests in two bearings. Behind the spindle and the wax cylinder is a rod, upon which is arranged a slide, having at one end an arm, carrying a pivoted head with two dia-

phragms, one for recording and the other for reproducing sounds, and at the other end an arm adapted to engage a screw cut on the spindle, and also, by a hooked portion, another screw nearer the front, called a "kick-back" screw. The manner in which the arm is thrown into and out of gear with the screws will be better understood from Fig. 4. In Fig. 1 it will be noticed that at the extreme front right-hand end of the machine is a milled head controlling, as shown in Figs. 4 and 5, a small cam which can be made to tilt the pivoted bar A through a certain angle, which will be shown by an index and marks on the head B. Upon the angles through which the bar is tilted depends the height of its front edge. On this rests the hooked portion of the arm shown at the left in Fig. 1. The hook itself engages with the "kick-back" screw underneath, while the main spindle screw is engaged on the top by a threaded section on the under side of the arm. The recording and reproducing diaphragm frame also is supported on the edge of the bar A (Figs. 4 and 5). When this bar is so turned that its edge is at its lowest position, the arm at the left in Fig. 1 also is at its lowest position, and consequently its threaded position is in gear with the main spindle screw, imparting to the diaphragms a lateral movement. By slightly turning the head B the edge of the bar A is raised, raising with it the diaphragm frame, so as to have the stylus of whichever one may be in working position clear the wax cylinder and raising also the hooked arm, throwing it out of gear with the main spindle screw. The spindle and cylinder then revolve idly. By turning the head B further and raising the edge of the bar A still higher, the hook of the arm is brought into gear with the "kick-back" screw. This screw is of much coarser pitch than the other and revolves in the reverse direction, its office being, in reproducing, to bring the stylus on the reproducing diaphragm back to any desired point, as may be determined by the scale and index on the front of the machine, so as to repeat any particular part of the record. The arm may be thrown into or out of gear with the main screw by a treadle arrangement not shown, so that in transcribing the record on the wax cylinder by means of a typewriter, for example, the operator may stop the reproduction with his foot at any point, after having heard as much as he can conveniently remember, and proceed again when ready for the next sentence.

The position of the diaphragms can be readily adjusted by swinging the head in which they are mounted so as to bring either the recorder or the reproducer, as required, in its proper place in front of the wax cylinder. Suitable adjusting screws are, moreover, provided for securing a proper degree of pressure between the stylus of each diaphragm and the cylinder. The recording diaphragm, shown in its working position in our engraving, is furnished with a funnel-shaped mouth-piece, attached to a short, flexible tube, and in Fig. 2 is represented, with its accessories, on an enlarged scale. The diaphragm proper consists of a very thin plate of malleable glass and the stylus is attached to its center, being, in addition, pivotally connected to a spring arm fixed to the side of the diaphragm holder. Fitted slightly in advance of the stylus is a small knife, clearly shown in the illustration, which prepares a new, clean surface for the impression, cutting away all traces of previous records should there have been any on the wax. Of the reproducing diaphragm we give a detail view also, in Fig. 3. It consists of bolting silk thinly coated with shellac, and the needle or stylus is attached to its center through the intervention of a small piece of cork, being, besides, connected with the side of the diaphragm-holder, as in the case of

the recorder, by an arm, as shown. In reproducing musical notes the cork support just mentioned is replaced by rubber, this material having been found more satisfactory for the purpose because of its greater elasticity. The sound waves produced by the diaphragm are transmitted through a rubber tube, which is branched and provided at its extremities with ear pieces similar to those of a stethoscope. These are lightly placed in the ears of the operator. To make the necessity of this clear, we will explain that in the early form of phonograph distinctness and accuracy were sacrificed to volume of sound, while in the present instrument the reverse is the case; so that while

for action on the wax cylinder, or phonogram, as it is called. As this revolves the small knife previously mentioned, operating similarly to a lathe tool, prepares a smooth surface on the wax, and, in virtue of the arrangement adopted, is immediately followed by the recording stylus, which, under the influence of the vibrations of the glass diaphragm produced by the sound entering the mouthpiece, cuts into the wax and produces corresponding indentations.

The diaphragm with its stylus and knife is fed along by the screw cut on the main spindle, the "kick-back" screw being out of gear, and slowly traverses the wax cylinder. After the record is made, the carriage is again returned to the point of

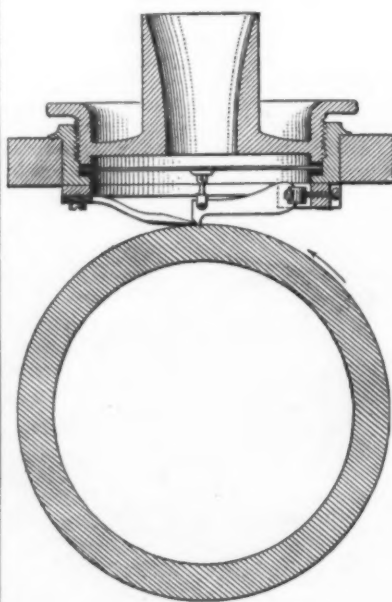


Fig. 2.—Recording Diaphragm.

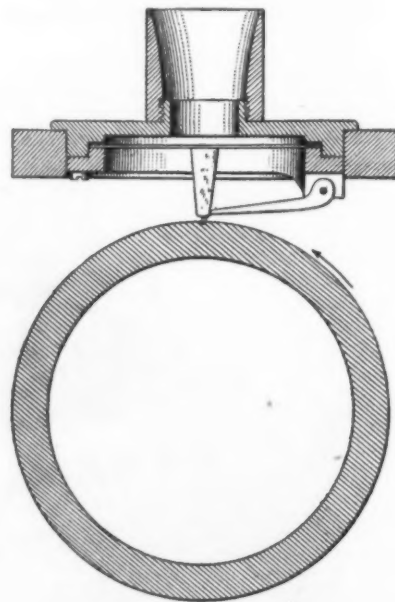


Fig. 3.—Reproducing Diaphragm.



Fig. 4.—End View of Disengaging Gear.

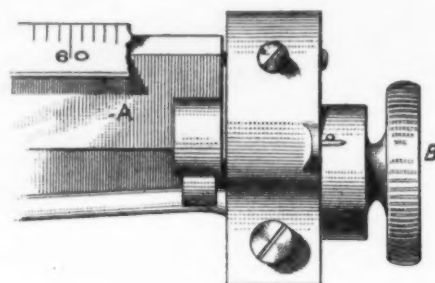


Fig. 5.—Elevation of Disengaging Gear.

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the reproduced sound is audible only to the operator equipped with the branched tube and ear pieces referred to, it is heard exactly as it was delivered into the mouth-piece against the recording diaphragm, all the variations of tone being faithfully given. So delicate is the reproduction that there is no difficulty in recognizing all the peculiarities of a familiar voice which may have been brought to act on the recorder. Motion for the instrument is supplied by a small electric motor in the box forming the base of the apparatus, connection being made with a battery. The governor only of the motor can be seen in Fig. 1, at the extreme left. The motion is transmitted to the main spindle and to the "kick-back" screw by a number of small belts and pulleys. From what we have thus far said it will perhaps have already been understood that in using the phonograph the recording diaphragm is first placed in its proper position

starting, the recording diaphragm is replaced by the reproducing diaphragm, and the carriage is again moved forward by the spindle screw as the cylinder revolves, causing the stylus of the reproducing diaphragm to traverse the path made by the recording needle. As the point of the curved wire attached to the diaphragm follows the indentations of the wax cylinder, the reproducing diaphragm is made to vibrate in a manner similar to that of the recording diaphragm, thereby faithfully reproducing the sounds uttered into the receiving mouthpiece.

A little thought will suggest a variety of uses for the phonograph. It may be employed for dictations and testimony in court, for reporting speeches, for the reproduction of vocal music, for teaching languages, for correspondence, &c. In dictating, one may talk as rapidly as one chooses, every word and syllable will be caught upon the delicate wax cylinder.

and afterward the latter may be transferred to the phonograph of a copyist, who may listen to the words of a phonogram and write out the manuscript. If any portion of the speech is not understood by the transcriber, it may be repeated as often as necessary. In a similar manner a compositor may set his type directly from the dictation of the machine, without the necessity of "copy," as it is now known. The wax cylinders are very light, and may readily be mailed in specially devised mailing cases. A number of records may be made on each cylinder owing to the thickness of the wax walls, the surface of which is cleared before every new series of impressons by the knife which travels in advance of the recording stylus. A performance of the apparatus which we had the pleasure of attending a few weeks ago was very striking and demonstrated in an entirely satisfactory manner, its capacity for accurate sound reproduction.

Similar in principle to the phonograph, as we have stated in the foregoing, is the

pared hardened wax and is very light. Not more than one tracing over its surface can be made, but its cheapness obviates the objection which might otherwise be raised to throwing it away and substituting a new one with a fresh surface. Below the cylinder is arranged a pan for receiving the fine shreds of wax which the recording stylus cuts from it, the number of grooves to the inch being about 160. At the right hand of the instrument is arranged a small rock shaft, provided with a cross arm and two keys working a clutch, by which the driving wheel is thrown into and out of connection with the gearing of the machine.

Upon the tube which incloses the feed-screw is placed a counter-weighted saddle, A, provided with a follower, which enters the slot of the tube and engages the feed-screw. The saddle carries a frame, in which is arranged a diaphragm of mica provided with a stylus, which engraves the record in the surface of the cylinder. The arrangement will be more readily understood by referring to Fig. 7, which repre-

recorder, a light spring, however, being used to press the stylus against the record cylinder. This spring is not necessary in the case of the recorder, since the weight of this with its attachments is much greater and amply sufficient to give a satisfactory impression on the wax.

In reproducing what has been recorded on the cylinder the recorder is replaced by the arrangement just described, and ear pieces of the branched tube are adjusted in the ears of the operator. The apparatus being put in motion and one of the small clutch keys shown on the right of the machine being pressed the reproduction of what is recorded on the wax cylinder commences, and when as many words as is desired are produced a slight pressure on the second key stops the cylinder, while the motion of the driving-wheel at the left continues, and the words reproduced are printed by the type-writer. The first key is then pressed again, and a few more words of the record produced, which are in turn printed by the type-writer, and so on throughout the record. The capacity

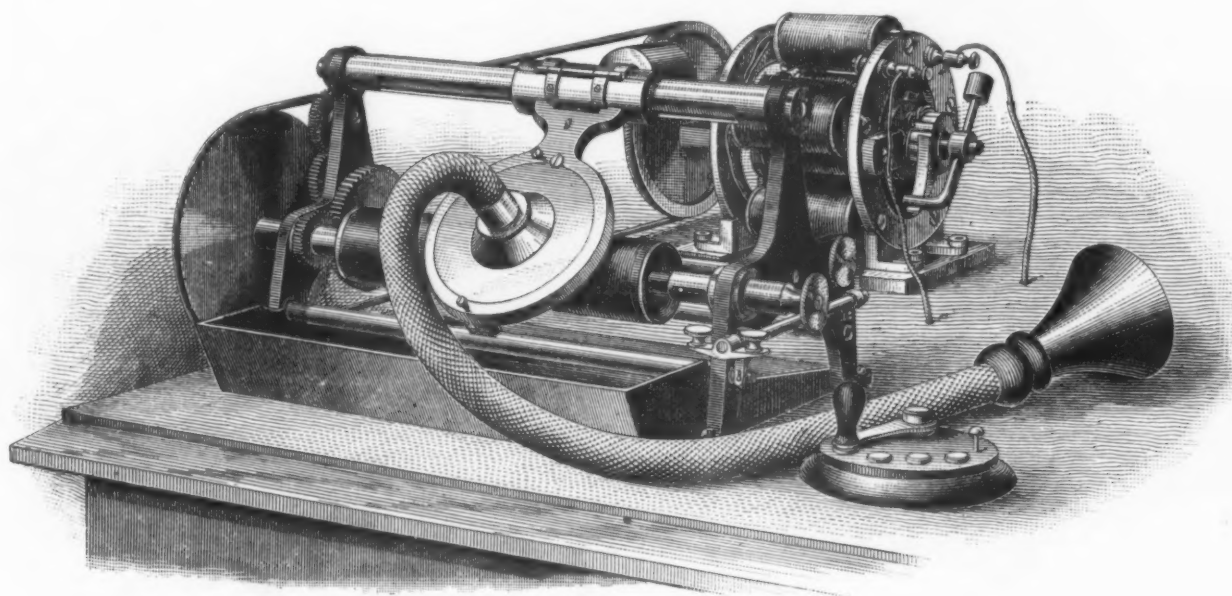


Fig. 6.—The Phonograph-Graphophone.

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phonograph-graphophone, invented a number of years later by Mr. Charles Sumner Tainter and rapidly developed by him into a practical and commercially valuable machine. Our engravings of it will show that, as compared with Mr. Edison's device, it is an exceedingly simple piece of apparatus. Fig. 6, which we prepared from a photograph, represents a general view. The frame of the machine consists of end pieces connected by longitudinal rods. In the top of the frame is journaled a fine screw inclosed in a slotted tube, the screw being driven through a train of spur-wheels from the main shaft journaled in the lower part of the left-hand end piece. The main shaft, besides carrying the gearing which moves the feed screw, is provided with a conical chuck. In the opposite end of the frame is journaled a spring-pressed spindle, which also carries a conical chuck of the same form and size as that on the main shaft. The cylinder upon which the sound is to be recorded is received between these chucks in much the same manner as the bobbin is placed in the bobbin winder of a sewing machine, the cylinder being revolved by frictional contact with the chuck on the main shaft. The cylinder consists of a spirally wound strip of paper coated with a specially pre-

sents a section through the recording diaphragm and clearly explains its construction. It will be noticed that a metal bridge extends across the face of the diaphragm, being attached to opposite sides of the diaphragm holder, and rests, at its middle, upon the record cylinder a little in advance of the stylus, thus supporting the weight of the diaphragm and its direct attachments. The depth to which the stylus penetrates the wax coating is in this way also regulated. Fig. 7 shows, further, that the saddle A is made up of two parts, hinged on top so that, together with the diaphragm holder, it can readily be removed. The recording action is much the same as in the phonograph, the diaphragm with its stylus being fed along the axis of the wax-coated cylinder by the screw B, while tracing its record on the wax. A separate and smaller reproducing diaphragm also is used, its construction being illustrated in Fig. 8. The reproducing stylus is pivoted, as shown, and transmits its vibrations to the diaphragm through a delicate rod. From the diaphragm holder is led a flexible tube, branched as in the case of the phonograph, and similarly provided with ear pieces, the whole being shown in Fig. 9. It is mounted on the tube inclosing the feed-screw B, like the

of a wax cylinder 6 inches long and 1½ inches in diameter when dictated to at the rate of 150 words per minute is about 700 words, this, however, depending upon the surface velocity.

The groove cut in the wax by the recording stylus is only $\frac{3}{1000}$ -inch wide and less than this depth, and 161 grooves to the inch are cut on the cylinder. The total length of the record on a 6-inch cylinder will therefore be about 250 feet. Cylinders 2, 4 and 6 inches long are used. The operation of changing them does not occupy more than a few seconds. Motion is derived from a small electric motor of special design, the invention of Dr. Orazio Lugo, of New York, worked by a battery. In Fig. 6 it is seen at the left toward the rear. Changes of speed may be effected by a switchboard alarm in front, at the right.

It is of no little interest to note that within the past half year phonograph-graphophones have been to some extent in practical every-day use, and have demonstrated their entire practicability and value as labor-saving devices. They were used in Washington in both houses of Congress for work in connection with reporting the proceedings and also by members for the dictation of their correspondence, &c. We

understand that many of the leading stenographers and lawyers at Washington are also using them, and find them of great help in their work. Thousands of record cylinders have been issued to supply these machines. Like the wax cylinders of the phonograph, they can be made to reproduce the records on them over and over again, and can be sent through the mails in specially devised boxes.

Both Mr. Edison's and Mr. Tainter's machines are controlled by the North

Mr. Tainter's design bids fair to be the more extensively employed, the character of its work being highly satisfactory for the purpose held mainly in view, and its construction throughout being simpler than that of the phonograph proper. Perhaps our readers have arrived at the same conclusion after having compared the general views Figs. 1 and 6. At the same time, we do not wish to be understood as desiring to disparage in any way Mr. Edison's apparatus. Its design and con-

cent atlas which the Geological Survey of that State have prepared and published, will be sold at the price of 25 cents each, either singly or in lots. This price is said to cover simply the cost of paper, printing and postage. Nothing finer in the way of topographical maps has been done by any of the State Surveys, and a real public service has been rendered in making these sheets available at a price so reasonable.

Steam Trials of the Italian Armored Lepanto.

A paper of special interest was presented at the last meeting of the British Institution of Naval Architects by Major Soliani, giving particulars of the steam trials of the Italian ironclad Lepanto. In these trials it was the first time that a power of 16,000 indicated horse-power had been developed on board an ironclad, giving her a speed of over 18 knots, and that a large number of locomotive boilers, in connection also with boilers of a different kind, had been worked together with complete success. The principal dimensions of the Lepanto are as follows:—

Length between perpendiculars	400 feet 6 inches.
Breadth	72 feet 9 inches.
Depth, molded	46 feet.
Mean draft, normal	28 feet 4 inches.
Area of midship section	1843 square feet.
Displacement	13,851 tons.

The ship is entirely built of steel, and has no sheathing on her bottom. There are six compartments of boilers, but only the two near the engine-rooms have marine oval boilers, four in each, and the remaining four compartments have locomotive boilers, four in each, making a total num-

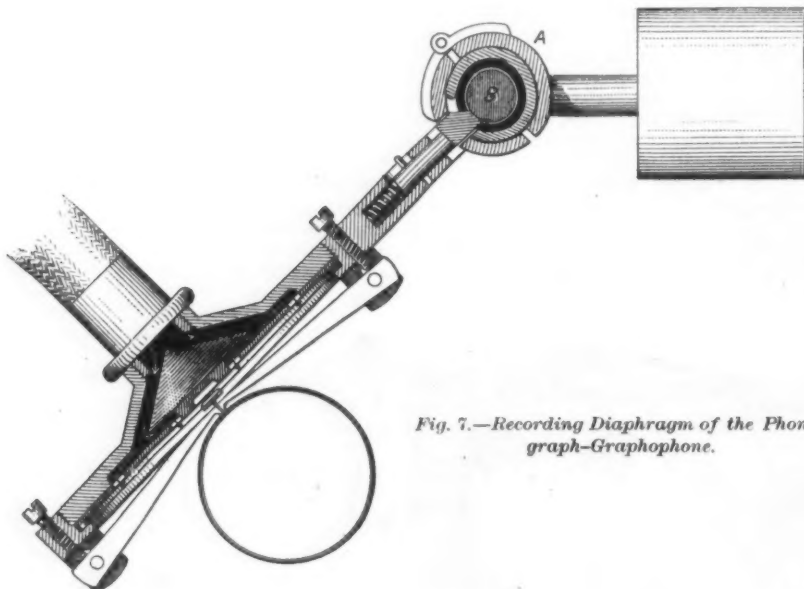


Fig. 7.—Recording Diaphragm of the Phonograph-Graphophone.

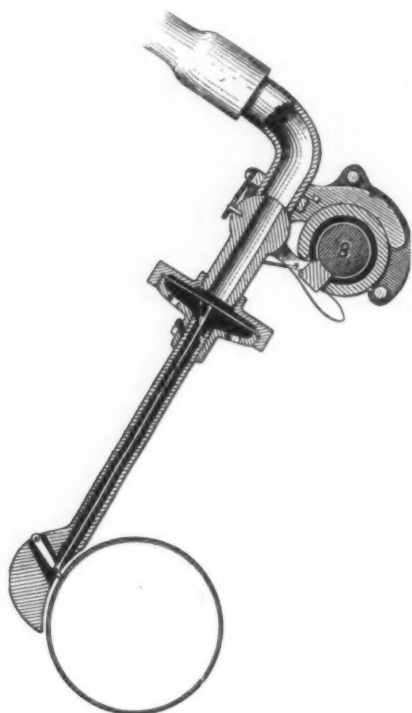


Fig. 8.—Reproducing Diaphragm.

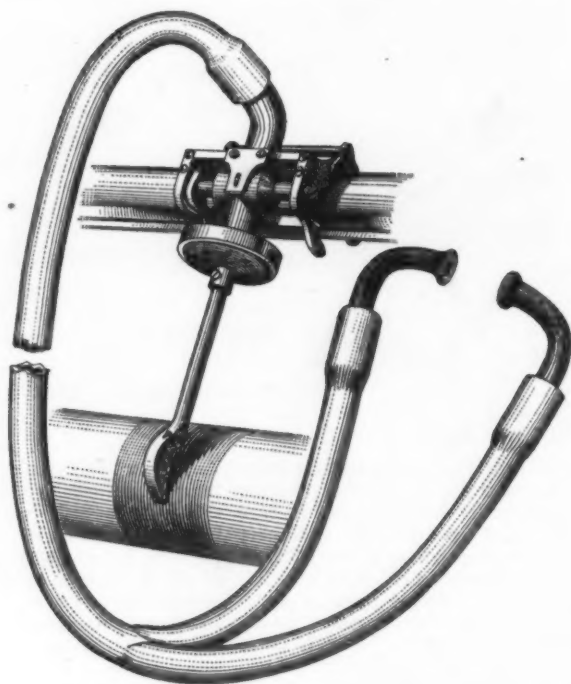


Fig. 9.—Reproducing Diaphragm and Attachments in Position.

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American Phonograph Company, 160-164 Broadway, New York, and will be offered to the public at the same fixed rates per year or part of a year, this plan being adopted in preference to disposing of them by outright sale. Prospective users can thus have their choice of either of the machines uninfluenced by difference in cost, and the demand for either the one or the other will be, to some extent, a measure of its popularity and special adaptation to every-day requirements. On our part it would seem to us that, for general utility, the phonograph-graphophone of

struction are characteristic of the inventor's high attainments in the line of applied science, and we are inclined to think that for special uses, as in laboratory work, it may be found superior to the other. But its greater complication in its present shape would seem to be a drawback of some importance. Whether or not we are correct in this will be shown by future developments.

Prof. George H. Cook, of New Brunswick, the State Geologist of New Jersey, announces that the sheets of the magnifi-

ber of eight oval marine boilers and 16 locomotive boilers. The trials were to be made in accordance with the following programme, proposed by Messrs. John Penn & Sons, and accepted by the Ministry of Marine:—(1) A trial with only two oval boilers lighted, and the after engines only at work on the compound system, to ascertain the most economical steaming of the ship. (2) A trial with the eight oval boilers lighted, the four engines working compound. (3) Ditto, with the four engines working direct expansion. (4) A forced draft trial with

only the after set of engines and boilers at work, the engines working direct. (5) A forced draft trial with all eight oval boilers and eight locomotive boilers lighted, the four engines working direct. (6) A full-power forced draft trial or trials with all the engines and boilers at work, the engines working direct. This programme was not completely carried out, on account of the ship having been put into commission, which prevented the final 18,000 indicated horse-power trial being made. The trials were made along the eastern coast of the Gulf of Genoa, from Spezia to Genoa and back, the two runs being altogether of over 80 nautical miles. A portion of the forward run from Spezia to Genoa was taken in each trial to bring up the engines to the desired speed. After the rather discouraging experience with locomotive boilers working in sets on board some ships, as the Flavio Gioja of the royal Italian Navy and the Polyphemus of the Royal English Navy, some fear was entertained that similar troubles might be experienced with the Lepanto, in which the difficulty appeared to be still greater, considering the large number of boilers to be worked together in so many different separate compartments. But nothing of the kind happened. Everything went to prove the contrary. From the very beginning of the preliminary trials, which took place toward the end of last year, the locomotive boilers gave evidence of their good working, which went on increasing trial after trial, so as to be now an established fact. They never primed or gave any trouble whatever. The feeding was occasionally uncertain, but the fault was due to air that collected in the main feed-pipe. This imperfection was removed, and on the last two trials the feeding was quite satisfactory. After each one of the last three forced-draft trials the locomotive boilers had tubes leaking, but in small number, and not more, comparatively, than the oval boilers, which, even in this respect, did not behave better. Moreover, there were discrepancies between the different compartments of boilers, locomotive as well as oval, which shows that the management of the fires has a great deal to do with this matter. The engines worked very satisfactorily all through the trials, without the slightest hitch occurring in any part of the whole machinery. This circumstance helped, no doubt, to some extent the good performance of the boilers, which had never to be checked or hampered when in full swing. The power developed was 16,150 indicated horse-power, which gave a speed of 18.38 knots, the displacement of the vessel at the time being 14,860 tons, and the mean draft of water 30½ feet.

This association of locomotive with ordinary marine boilers as a cheap way of getting a portion of the power required in war ships has attracted attention for many years, and would, no doubt, have been more widely developed had it not been for the somewhat discouraging experience which the system gave rise to in the English navy.

A Chicago Elevated Project.—Another elevated railway scheme has been projected in Chicago. On the 29th ult. articles of incorporation were recorded in the office of the Secretary of State of the Chicago West Division Elevated Railroad Company, with a capital of \$10,000,000. It is intended to construct a railroad from a point in the south town of Chicago, north of Harrison street, west of Clark street, south of the river, to the western limits of the city, between Harrison and Lake streets, with four branches. The board of directors are Andrew Onderdonk, of New York; James Ross, of Sherbrook, Quebec; William D. Howard, John J. P.

Odell, James Deering, George S. Willits and William G. McCormick, of Chicago. Henry B. Robbins and Charles L. Brooke are incorporators, but not members of the board of directors. The scheme of the incorporators is a big one. The route proposed is sufficiently indicated above, but it is claimed that with the exact line of travel they have in view no fine residences or buildings will be interfered with. The incorporators will, at an early day, apply to the Council for an ordinance permitting them to go ahead with their scheme. It is the idea to cross the river by means of the bridge, and it is said that the inconvenience caused by the opening of the bridge during the navigable season will be but small, as the cars, running on their own unobstructed roadbed, can make good time when in motion. The fare is to be 5 cents.

Paper Belting.

Messrs. Crane Bros., of Westfield, Mass., have contributed to Mr. Cooper's book on "The Use of Belting," some interesting particulars relating to their paper driving belts. These are made from pure linen stock and can be made of any desired thickness, width and length. They are recommended only for straight and unshifted belts, and none are made less than 5 inches wide. They will not stretch nor change shape, and being made all in one piece, of even thickness, will run smoothly and straight. They are claimed to be equal in durability with leather, and equal also in strength. They adhere to the pulleys very closely and generate no electricity while running. Furthermore, they are quite flexible, and are claimed not to crack in passing over pulleys even as small as 6 inches in diameter. They are not affected by heat at ordinary temperatures, nor by dust or oil, but will not run in water. Compounds similar to those used for stuffing leather belts, or black lead, mixed with sperm oil, are said to be very good to apply to these belts when dry and slipping.

Electric Motive Power.

The electric motor business which was in a nascent state a few years ago is now developing at an even faster rate than the electric light business, though the amount of capital invested and the value of the plant is comparatively small. At the present time there are in use, in Boston for example, a large number of small motors for various purposes, furnishing in all about, roughly estimating, 500 horse-power. In New York City it is estimated that there is about 800 horse-power furnished by electric motors for various small industries. In Philadelphia there are a considerable number of electric motors in constant use, and the same is true of Buffalo, Cincinnati and Cleveland and their number is rapidly growing in all the large cities. In Chicago and Detroit the number is smaller and the use somewhat restricted owing to the efforts being made by municipal authorities to have the wires put underground and the consequent difficulty in making additions to the systems of overhead wires. The motors in use range in power from ¼ horse-power to 15 horse-power. A number of motors of ½ horse-power and others of 25 horse-power are also in use. In addition to the largest cities mentioned above, there is a considerable number of motors used in the smaller cities, such as Bangor, Me.; Lowell, Newburyport, Lynn and Springfield, Mass.; Providence, Pawtucket and Woonsocket, R. I., and other of the smaller cities of the East, and in St. Louis, Kansas City and other Western cities.

The question naturally arises as to the uses which these motors, furnishing as

they do small amounts of power, are put. In a general way it may be said that they are employed in all those industries and work which has formerly been done by a small amount of steam-power or by the gas engines and water-motors which have been quite extensively employed during the last few years. They are employed for driving air compressors, bookbinding machinery, bakers' machinery, blowers, cranes, carpenters' machinery, cash carriers, coffee mills, churns, drug mills, dumb waiters, dentists' lathes, drill presses, elevators, grindstones, hydraulic presses, hatters' machinery, ice-cream freezers, jewelers' lathes, knitting machines, lathe working machinery, laundry machinery, looms, paper box machinery, polishing machines, pile driving, printing presses, quotation transmitters, sewing machines, stamping machines, ventilating machines, washing machines, and a hundred other small uses.

Perhaps the most important use of motors at present is on elevators, printing presses and sewing machines, and in each line a large and increasing number are constantly being used. The increase in the many different outside uses is even faster. Wherever a moderate amount of power is needed the electric motor can supply it. The economy of the stationary electric motor over small steam and gas engines is claimed to be considerable. It is based upon the fact that large engines consume much less coal for the power furnished than do small engines.

In the transference of power through the dynamo and motor to the machinery about 20 or so per cent. is lost, but even with this it can be seen that large power may be produced at a central station and sold out to consumers cheaper than they could produce it by small engines. Incandescent electric light lighting companies can afford to sell the motor power cheap, as the motor business is of great and positive advantage to them in giving employment and earning capacity to their plant when it would otherwise be idle and profitless. This arises from the fact that most of the electric lighting is done at night, and the machinery and plant of the company is then employed, while during the day time it would be idle. The advantage to the consumer of electric power is found partly in the greater neatness, cleanliness and compactness of the motor as compared with engines, and from the fact that the motors require no attendance and the power can be turned on or off by a switch. The motors themselves as mechanical devices are claimed to be about 25 per cent. cheaper than engines. In most cases the motors are sold outright to the consumers, and the power is leased, but sometimes both motor and power are leased.

The Italian Admiralty have recently caused to be carried out a number of experiments with a view to testing the comparative merits of castor oil and of olive oil for lubricating purposes on board ship. From the results obtained they have given orders that henceforth all exposed parts of machinery are to be lubricated exclusively with castor oil, while mineral oils are to be used for cylinder and similar lubrication.

The Southern Railway and Steamship Association have issued in pamphlet form the new classification of freight for the use of all lines between Eastern and Western points and Southern points. This classification went into effect on the first of this month.

Evans & Howard, of St. Louis, Mo., manufacturers of fire-brick, gas retorts and sewer-pipe, have issued a new catalogue.

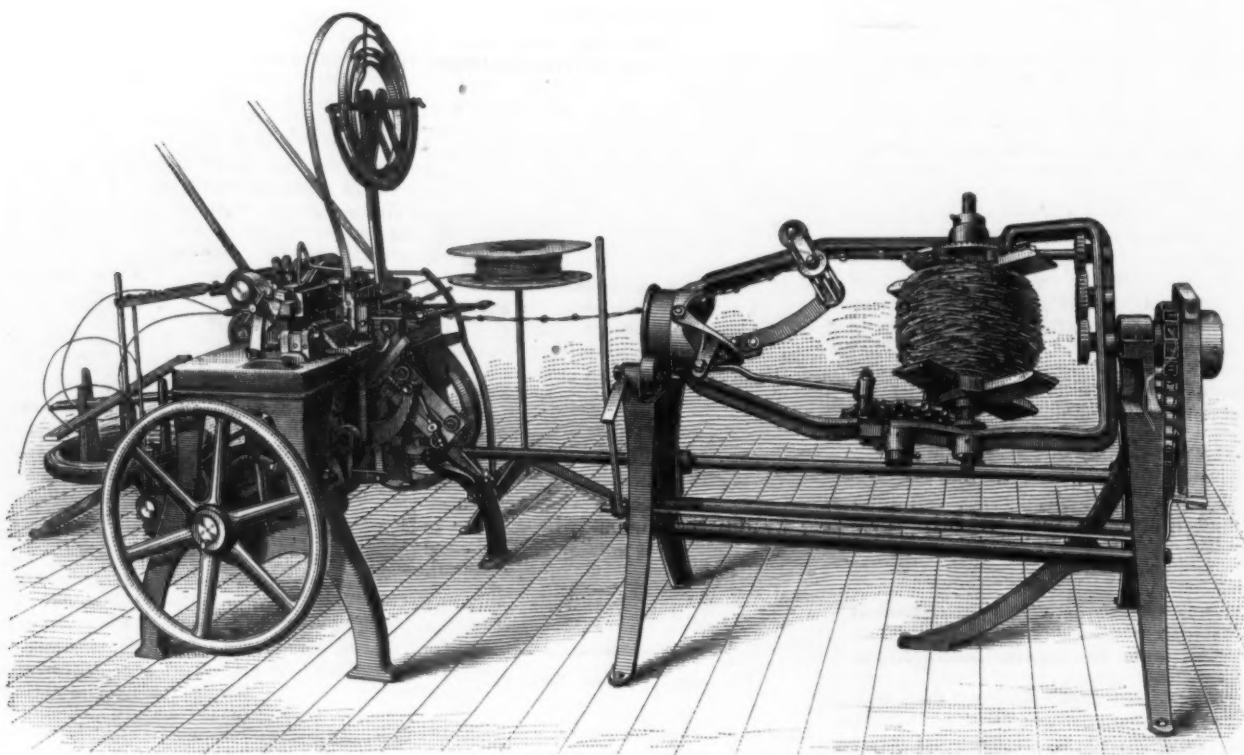
Peculiar Electrical Phenomena.

Some very singular electrical phenomena were observed on two very dry days at a printing office in Mayence, Germany, when the establishment seemed to be converted into a huge electrical battery. According to the *English Mechanic* electric sparks several centimeters long could be drawn with the fingers from all parts of the printing machinery, just as may be done from a charged electric machine. The action of the sparks became so pronounced that the layers-on and takers off (who, it should be remarked, in German printing offices are mostly young women) refused to work, as burning sparks were emitted every time the machines were touched with the hands. The electrical phenomena were most striking in the machines used for lithographic

The floors of the several machine rooms are also laid thick in asphalt, and the machinery is fixed direct to this flooring, so that it is likewise perfectly isolated. There are only a few iron columns having direct connection with the earth. On the morning of the day on which the startling phenomenon described was first observed, all the machine belts had been greased with a mixture consisting of resin and linseed oil, serving to increase the friction between the belts and the pulleys. As soon as the machinery was set in motion, each individual pulley was converted into an electric machine on a large scale, negative electricity being formed on the belt covered with resin, and positive electricity on the iron pulley. The stored electricity, of course, was immediately given off whenever one of the machines, which for the

ing only been issued November 23, 1887. Chester A. Hodge is the inventor of the present form of fencing made, also the owner of the machinery patents and builder of the machines, while the Larm Mfg. Company have the exclusive license for the use of the machinery and the manufacture of the fencing. At present four machines are in operation, but others are being built and six more will be running in time for the fall trade, to be followed by additional machines as fast as they can be completed.

The principles involved in the construction of the machine to make this fencing and to twist and spool it are very ingenious, and worthy of detailed description and illustration. We find, however, that the space at our command is too limited to admit of showing all the engraving



MACHINE FOR MAKING SPUR WIRE FENCING, AT THE WORKS OF THE LARM MFG. CO., CHICAGO, ILL.

printing. A strong paper made of cellulose was being printed at the time, and the takers-off observed a slight crackling as the sheets, which adhered pretty closely to the oil-cloth covering of the cylinder, were being withdrawn. This crackling was finally developed into a loud explosion, accompanied by beautiful flashes from 10 to 12 centimeters (from 4 inches to 5 inches) in length. The discharges are stated to have been more effective the more quickly the sheets loaded with electricity were withdrawn. A small circular saw mounted about 4 inches from an iron column discharged at intervals of from 20 to 30 seconds, when driven, powerful electric sparks, accompanied by loud explosions, upon the column. These phenomena were observed for hours, and continued two days, when the printing office became free from electricity, and has remained so since.

The following explanation is given of the occurrence: The outer walls of the building in which the printing machinery is placed are separated from the surrounding soil by a thick layer of asphalt, serving to keep the moisture arising from the soil from penetrating the walls. In the present case the asphalt at the same time served to isolate the electricity generated within.

time being were changed into accumulators or secondary batteries, was "tapped."

Spur Wire Fencing Machine.

The Larm Mfg. Company, 84 and 86 Market street, Chicago, have succeeded, after a long series of experiments, in perfecting a machine to manufacture their "Harmless Spur Wire" fencing. This fencing is intended to compete with barb wire, to which it is claimed to be preferable, as it will turn cattle without severely pricking them. Instead of a rigid barb the Larm wire has a revolving spur, or toothed wheel, which works on a small piece of wire extending between the two strands. The engravings on the opposite page explain the construction. The spurs are 3, 4 or 6 inches apart, and consist of star-shaped pieces of steel so mounted on a cross wire as to revolve easily. Fig. 1 shows the twisted wire with the spurs thrown at right angles, and Fig. 2 shows the strands straight, both kinds being made by the company. This fencing was invented several years since, but the machinery for its manufacture has so recently been perfected that it is a comparatively new article in the market, the patents hav-

ings (about ten in number) that are necessary to a full understanding of the various operations, and must confine ourselves, therefore, to the use of a perspective view only. This, however, will give a fair idea of the general character of the design. We would refer those of our readers who are specially interested in the machine to the patent office records, the specification bearing the number 373,458.

The main idea is, of course, the revolving spur, which takes the place of a rigid barb, and thus overcomes an objection often made to the use of barb wire fencing. This spur, as mentioned above, is of star shape and is cut from steel hoops or strips, 1 inch wide and of No. 22 gauge. At first these stars were cut out by one machine and fastened in place by another, but now this work is all done on the single machine, which we illustrate. The steel hoop is coiled on a reel on top of the machine, as shown at the left. It is intermittently fed forward into position in front of a punch for punching the central hole in the star, this hole being punched before the star is cut out.

The punch and die for cutting out the star are located further along in the path of the star-strip, and operate to cut out the star at the end of the strip at the same

time and by the same movement that the hole is punched in the strip for a succeeding star. The star-punch and its operating rod or slide are made hollow, and a rod or pushing device reciprocating in it serves to push the star cut from the strip out of the female die and in front of or into the star-pocket of a reciprocating slide, by which the star is fed into position between the two fence wires and in front of the cross pivot wire. This star-feed slide operates in a vertical plane passing between the two fence wires. The



Spur Wheel Fence Wire.—Fig. 1.—Twisted Wire.

pivot wire is then pushed forward just under the fence wires and inserted through the hole in the star. A horizontally reciprocating slotted pivot-bending nose or horn having guide holes through which the two fence wires pass is then moved forward into position for supporting the pivot wire, while the ends of the pivot are bent over or around the slotted horn and the fence wires, and at the same time a vertically reciprocating knife moves up and severs the pivot from the pivot-wire. This knife operates in conjunction with an opposing stationary knife. A pair of vertically reciprocating pivot benders or slides—one on each side of the fence wires and the horn, and one of which is integral with the movable knife before mentioned—move up (their motion being simply a continuation of the upward movement of the knife) and bend the two ends of the pivot up vertically or at right angles. A pair of horizontally reciprocating benders or slides then move inward toward each other over



Fig. 2.—Wire with Straight Strands.

the top of the lower or vertically moving reciprocating benders and bend the ends of the pivot down horizontally together. The slotted nose or horn then withdraws, and a clincher, occupying the space between the vertically moving benders and secured rigidly thereto, moves up and gives the finishing bend to the middle of the pivot. The benders and knives are then withdrawn and simultaneously the two fence wires and the star-strip are fed forward, and the star-feed slide also at the same time moves a second star into position between the fence wires.

The wire for the strands is fed from two reels in the rear, and the wire for the cross piece or pivot supporting the spur is fed from a reel at one side. The right-hand portion of our engraving represents the spooling and twisting machines, of which the operation, we think, is readily apparent.

Returning to the product of the machine, we note that the makers claim the wire to be harmless to stock, because it will not gash the skin, although it will prick sufficiently to warn animals away, and to be more plainly seen by stock than ordinary barb-wire fencing. The manufacturers assert, also, that the increasing demand from a widening circle of consumers supports these claims and demonstrates the satisfaction which the use of the wire is giving.

The new railroad freight tariff from Pittsburgh to all Pacific coast points was issued on Friday, the 24th ult., and will

go into effect on September 1 next. The rates have been advanced slightly. In some cases the advance is on the commodity and others on the rate. The new rates from Pittsburgh, Buffalo, New York and common points East, and West of Atlantic seaboard common points will be: First class, \$4; second, \$3.50; third, \$2.80; fourth, \$2.20. Class A, \$1.95; B, \$1.75; C, \$1.40; D, \$1.25; E, \$1.15. The rates on iron will be: Carloads, \$1; less than carloads, \$1.20. This rate is special. The rate formerly was 99 cents and \$1.08.

Labor at the Pencoyd Works.

Two Philadelphia newspapers, the *Record* and the *Times*, published charges that the A. & P. Roberts Company, of the Pencoyd Iron Works, near Philadelphia, employed imported Hungarian and Polish labor, and the employees were huddled together in "dirty" houses, and that the men were kept poor by means of a "pluck-me" store. In reply thereto the firm have prepared a statement, from which we quote the following:

The Pencoyd Iron Works at present employ about 1400 men. Of this number 132 are Hungarians and Poles. The appended table gives their number, wages per day and character of the work performed:

No. of Men.	Wages per day.	Occupation.
37	\$1.10	Laborer.
1	1.15	Laborer.
1	1.30	Laborer.
62	1.25	Laborer.
20	1.35	Laborer.
3	1.40	Shears.
2	1.50	Bridge shop.
2	1.55	Bridge shop.
4	1.80	Mill.
1	2.50	Mason.
1	2.75	Mason.
1	3.00	Mill.

132

The men paid \$1.10 per day perform a class of shifting labor which is necessary around every works of this size and character. It is not steady work, but embraces such occupations as loading ashes, unloading cars, &c. The work being irregular in its character varies from day to day and has always been supplied from men who have been in the country apparently only a short time and have not, as yet, been able to find more permanent occupation.

We positively deny ever having imported any cheap contract labor, and there is no Hungarian or Pole at present in our works who has not applied for work of his own accord and has been hired entirely upon the question of his fitness for the intended occupation, with no more reference to his nationality than to the names and residences of his grandparents.

There are at present 49 tenement houses belonging to the works, occupied as follows:

No.	Nationality.	Average No. each house, including children.
13	German.	6.0
4	English.	5.7
13	American.	5.0
14	Irish.	6.4
2	Welsh.	6.0
3	Polish.	3.3

49

The four houses referred to by the *Record* as "Noah's Ark," and containing "about half a hundred men," are leased to four German families. Each house contains three sleeping rooms, with beds. No room has more than two adults. Each house has four boarders only. By an examination of the table it will be seen that the highest percentage of inmates are in the houses occupied by persons of Irish nationality, while the lowest percentage are in the houses occupied by Poles.

Referring to the statements made by the *Record* in regard to a company store, we have to say that the store spoken of is a

small one, started some years ago for the purpose of supplying necessary goods to people living on the west side of the Schuylkill River, who were obliged to cross the river daily for the necessary articles of food. There is no compulsion whatever used in the matter, and many of the customers are not from among our own people. The sales average \$800 per week, while our pay-roll is \$15,000 per week, and, except in a small number of cases, mostly made up of single men, all accounts are paid in cash by the customers.

The steamship agency we are accused of holding for the purpose of importing emigrants has been for many years in the hands of our paymaster for the purpose of sending money to families and friends of the employees of the works who may not be in this country, and has sold during the last 20 months the following tickets: For 6 men, 15 women, 22 children and 1 excursion ticket.

English Armor Plate Trials.—Recent English armor plate trials have given some noteworthy results according to the *London Engineer*. The plate tested was manufactured by Messrs. Cammell & Co., and was forged under their new hydraulic press, which is capable of exerting a pressure of 5000 tons. In its way it was quite as remarkable as the compound plate which broke up all the shot, both steel and chilled, directed against it. It measured 8 feet x 6 feet, and was of a thickness of 10 inches. The composition of the steel is a trade secret, but its flexibility was such that it passed through the ordeal under fire without splintering or falling in pieces like the Creusot plates. Five shots were discharged against it from a 6-inch gun at 30 feet range. Two were chilled Palliser projectiles, while the remainder were Holtzer solid forged steel shot. The charge was 42 pounds, the muzzle velocity 1920 feet per second, and the muzzle energy 2556 foot-tons. The chilled shot were entirely broken up, but the indents in the plates were deeper than in the case of compound armor. The steel projectiles were pointed diagonally across the face of the plate, from the bottom right corner to the top left corner, the difference in the inclination of arm having an important effect upon the ballistic value of the various rounds. The first shot fired at the normal penetrated the plate, the base being about 5 inches below the surface. The second shot, fired at an inclination of 8°, buried itself in the target with the exception of 2½ inches; while the third and last round, fired at a deviation of 16° from the normal, protruded about 7 inches from the face. None of these projectiles were broken up, but plugged themselves into the plate, where they remained firmly fixed. The armor plate itself at the end of the experiment, though cracked in places, retained its position on the backing, and was in a fair state of preservation. Though the shot discharged point-blank at the target penetrated the plate, none succeeded in getting through, but were arrested and held firmly in the grip of the metal.

The Jersey City Board of Works received bids for purifying the present water supplies and for a new supply outright. The bids for purifying included the erection of a plant capable of aerating 24,000,000 gallons daily, as follows: Jewell Water Company, of Chicago, \$263,975; Philadelphia Water Purifying Company, \$210,000; United States Sanitary Filter Company, of New York, \$250,000; Hagerman & Olyphant Filter Company, \$275,000; American Filter Company, of Chicago, \$250,000; Hyatt Pure Water Company, \$350,000. The proposals for the new water supply were for the delivery at the

Belleville reservoir of 20,000,000 gallons daily. The Montclair Water Company, which proposes to obtain its supplies from the upper Passaic, bid \$40 per 1,000,000 gallons, and the Lehigh Valley Railroad, which proposes to use the Morris Canal to bring water from Lake Hopatcong to Jersey City, \$42 per 1,000,000 gallons. The Commissioners decided to call a public meeting for September 8, to discuss the entire question.

Improved Screw Gang Saw.

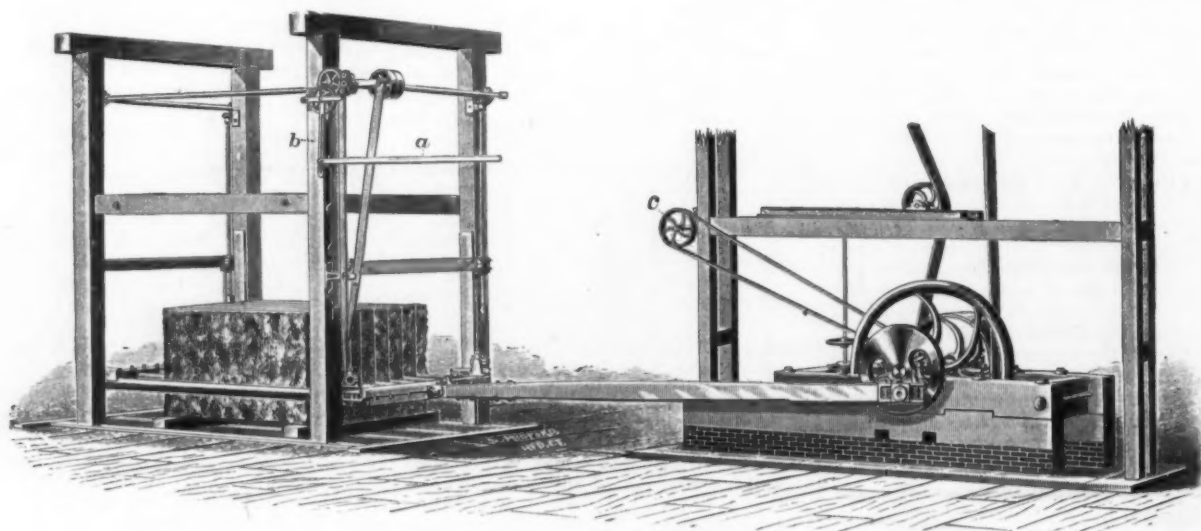
The Merriman screw gang for sawing stone, one modification of which is here shown, has been in use for a number of years and has demonstrated itself to be one of the best stone sawing machines made. Its superiority is largely due to the fact that the frame which carries the saws is fed down to the stone by a positive feed which is automatic and adjustable to stone of different degrees of hardness, and at the same time the frame is held firmly down while in action, so that the pressure of the

The "Carload" Lot Cases.

A "brief" has just been filed with the Interstate Commerce Commission which will undoubtedly prove of interest to the entire commercial community. The "brief" appears in what have been popularly denominated the "carload lot cases," three in number, which were brought on behalf of a committee of the New York Board of Trade and Transportation, by Thomas L. Greene, as manager of the Merchants' Freight Bureau of New York, on behalf of some hundreds of retail merchants in the interior States, and by Francis H. Leggett & Co., of New York, against the Trunk Line railroads. They were tried before the Commission in January last, after a mass of evidence had been taken at Mr. Fink's office in this city by deposition, and have just been submitted for decision. The plaintiffs' counsel are Simon Sterne and Charles F. Beach, Jr., of New York, Mr. Thomas L. Greene appearing in person. The counsel

and conditions attending the transportation to warrant such increase. The testimony shows that these great differences between carloads and less than carloads were imposed by the railroads for two reasons; one was to give back to the local roads their old local rates. It is a well-known fact that grocery staples were carried from station to station before the passage of the Interstate Commerce Act by the railroads at rates which were grossly out of proportion to the charges made for the transportation of like articles between competitive points. This gross discrimination against the small towns and villages was one of the main reasons for the passage of the Interstate Commerce Act, and it is shown that the present classification and tariff was arranged in this manner to give back to the local roads under another form the same local rates which they had before the passage of the act and which the act forbids.

It is also of interest in this connection to notice that before the 1st of April, 1887, twenty thousand pounds constituted the



IMPROVED SCREW GANG SAW, BUILT BY THE LINCOLN IRON WORKS, RUTLAND, VT.

saws upon the stone is uniform. This construction also counteracts the thrusting action of the pitman upon the saw frame, which becomes excessive when the saws are either at the top or bottom of a block, causing a jumping motion of the frame and saws, largely neutralizing their cutting action and destroying the machine itself.

The machine as shown is made by the Lincoln Iron Works, of Rutland, Vt., and has a saw frame of iron, the sides being made of heavy wrought-iron tubing and the heads or ends of 12-inch channel bars, two for each head. These are secured to each other by a strong casting, and when the saws are in it the frame is absolutely rigid. The crankshaft is made of hammered iron, and is 4½ inches in diameter. The bearing on the crank end is forged larger, being 6½ inches, and the pillow block for this end is made adjustable. The crank-wheel, which is keyed on this enlarged part, is made with a counter weight which balances, or nearly so, the weight of the pitman and its attachments. The wrist-pin is cast on to the crank-wheel and is made of ample size to prevent cutting and wear. The increase of speed and the addition of automatic feeding devices have made a great difference in the amount of cutting one of these machines will do. Some of the later machines have cut as much as 8 inches per hour, actual depth of cut, in Bedford, Ind., limestone, and as high as from 3 to 4 inches per hour in granite.

for the railways include such well-known lawyers as Judge Logan, for the Pennsylvania; Frank Loomis, for the New York Central; James A. Buchanan, for the Erie, and John K. Cowen, for the Baltimore and Ohio Railroad. The review of testimony and "brief" summary, as furnished to the press by complainants' counsel, reads substantially as follows: The matter complained of is the imposition of excessively high rates upon less than carload shipments from the East to the West on grocery staples and various articles of household and common use, as compared with very much lower rates for the carload quantities on the same articles. These discriminations were put by the railroad people into their West-bound tariffs since April 1, 1887, so that whereas ten years ago the classification from the seaboard West-bound had only 30 articles which took a less rate in carloads than for small quantities, the number now having such differences for quantity exceed 900 articles.

To arrange for the new state of things which was necessitated by the passage of the Interstate Commerce law, the railroads advanced the rates for small quantities of these staples on the 1st of April, 1887, to figures higher than for any time during the previous ten years, so that at the present time these rates for small quantities exceed the rate on the same articles when in carloads, in some instances, by more than 100 per cent., and thus, too, without any change in the circumstances

capacity of a car and was considered a carload quantity, but since that time no shipment for less than 24,000 pounds can, according to the rule imposed by the new tariffs, have the reduced rate, and as the carload is an increasing quantity really meaning any specified tonnage upon which the railroads may wish to insist, and as the newer cars have a capacity of 40,000, 50,000, and sometimes 60,000 pounds, the tendency is to make the arbitrary limit of a carload increasingly large, so that next year it may be advanced by the railroads from 24,000 pounds to twice that quantity, as it has just been advanced from 20,000 to 24,000 pounds, and may possibly be made ultimately as large as what constituted a trainload in the early history of railroading.

The railroad piers and stations in New York and all large cities receive large quantities of merchandise which individually are less than 24,000 pounds, but which bunched and loaded into cars to their full capacity make up full carloads, so that without any additional expense the railroad people get from such cars so loaded to their full capacity, on which the highest possible less than carload rate is charged, three times the revenue which they receive from carloads loaded with one kind of freight which go at carload rates. This is a gross wrong to the small shippers whose freight is so bunched and loaded, and who are, therefore, equitably entitled to the benefit of any such economies in transportation.

The testimony of the witnesses for the railroads in these cases fails to justify these differences, the witnesses, however, disagreeing among themselves as to the reason of such differences. The theory of difference in the cost of service was one of the main reasons advanced by the witnesses for the railways in defense of the present rates, but it was shown that this cost bears no relation to the difference in the rate, and indeed in this regard the whole tariff seemed to be arranged by "rule of thumb," no definite principle being discovered.

It was shown in the testimony that the difference in the rate of freight charges in the case of most of these articles equals or exceeds the jobber's net profit, so that such a freight rate practically prohibits sales of these goods at the seaboard and shipments West-bound in the smaller quantities.

The result of the present classification is, therefore, that the retail grocer throughout the country is restricted in his buying to his own home market; the lack of competition resulting therefrom increases the prices he has to pay and decreases the quality of his goods, so that the consumers, who are the customers of the retail grocer, and the majority of whom are included in what is known as the laboring class, must, if the present state of things becomes permanent, pay higher prices for poorer goods.

The Tube and Pipe Makers.

Their Argument Before the Senate Finance Committee.

On the 24th ult. William J. Curtis, of the law firm of Sullivan & Cromwell, appeared before the Finance Committee of the Senate as the representative of the following tube and pipe manufacturers of the United States:

Haxton Steam Heater Company, Kewanee, Ill.; Crane Bros. Mfg. Company, Chicago, Ill.; A. M. Byers & Co., Pittsburgh, Pa.; Chester Pipe and Tube Company, Chester, Pa.; Continental Tube Works, Limited, Pittsburgh, Pa.; Conshohocken Tube Company, Conshohocken, Pa.; the Allison Mfg. Company, Philadelphia, Pa.; James Hooven & Sons, Norristown, Pa.; Morris Tasker & Co. (incorporated), Philadelphia, Pa.; Pennsylvania Tube Works, Pittsburgh, Pa.; American Tube and Iron Company, Middletown, Pa.; Pittsburgh Tube Company, Pittsburgh, Pa.; Reading Iron Works, Philadelphia, Pa.; Spang, Chalfant & Co., Pittsburgh, Pa.; Syracuse Tube Company, Syracuse, N. Y.; Duquesne Tube Company, Pittsburgh, Pa.; Oil City Tube Company, Oil City, Pa.; Riverside Iron Works, Wheeling, W. Va.; Curtis & Co., Syracuse, N. Y.; National Tube Works, McKeesport, Pa.

He presented the following argument, the petition having been prepared under the supervision of Mr. Converse, of the National Tube Works:

To the honorable the members of the Senate Committee on Finance: GENTLEMEN.—The manufacturers of wrought iron and steel tubes and pipes in the United States beg leave to request a revision of the tariff affecting their manufactures as established by the Mills bill, and to ask also for a new classification of their products. The proposed change will read as follows:

I. Plain-end boiler tubes, flues or stays, of wrought iron or steel, of diameters of (outside measurement) $2\frac{1}{2}$ inches or less, 3 cents per pound.

II. Plain-end boiler tubes or flues or stays, of wrought iron or steel, of diameters of (outside measurement) over $2\frac{1}{2}$ inches, $2\frac{1}{2}$ cents per pound.

III. Gas, water and steam tubes and all other classes and kinds of wrought iron or

steel tubular goods having threaded, flanged or socketed ends (permanent or detached) 2 cents per pound.

IV. All tubular goods having plain ends—i. e., no threads, screws, sockets or flanges shall be included in Classes I and II.

We shall justify the proposed duties by calling your attention briefly to the growth, magnitude and importance of the industry we represent.

Ten years ago there were only eight mills manufacturing wrought-iron pipe in the United States, and these were located in the States of New Jersey, Pennsylvania and Illinois. Under the fostering care of the American system of protection the industry has increased in the last 10 years from eight mills to thirty, scattered through eight States. The annual value of the product in 1878 was from \$15,000,000 to \$20,000,000, and from 6000 to 8000 hands (men and boys) were employed. To-day the value of the output is from \$30,000,000 to \$40,000,000, and the number of laborers engaged from 12,000 to 16,000. It will therefore be seen that there has been a growth of 100 per cent. in value of product during the last decade, due, as we claim, to the protection afforded, and this without injury to the consumer, as we shall hereafter show.

During this period there has been a growing demand for wrought-iron and steel tubes and pipes, caused by the growth of the country, the development of other manufacturing interests, and the creation and discovery of new enterprises, notably natural gas supply companies and oil wells. This active demand stimulated the manufacturers to increase their capacity, and while new mills have been erected they do not alone indicate the growth caused by extension and enlargement of old plants. At the present time the capacity of working mills is about one-half the whole amount, 15 mills being idle, having been closed because of too active competition, the business proving for the time being unprofitable. Since January, 1888, there have been two failures, besides the suspension of operations of three other large concerns. Even now, with 15 mills running, the capacity to produce is from 20 per cent. to 40 per cent. in excess of the present demand. This industry is very wide-spread in its usefulness, as the output of the mills enters into various manufactures and trades, such as locomotives and steam boilers of all kinds, gas and water mains, buildings and nearly all classes of construction work. The amount of capital invested may fairly be estimated at not less than \$15,000,000, involving a payment to laborers of not less than \$4,500,000 to \$6,100,000 annually. This capital is, of course, subject to all the influences of like investments, such as wear and tear, fluctuation in prices of raw material, and active home competition, and was embarked in the various enterprises in expectation of all these influences and conditions. The ordinary risks of business have been anticipated, and the manufacturers have confidently relied upon a reasonably stable governmental tariff policy, but they have not expected to be menaced by the dangers of foreign competition induced by a too radical change of the tariff.

The existing tariff has furnished substantial protection from foreign competition, the home demand being almost entirely supplied by home manufacturers. The class of goods in question are manufactured outside of this country, principally in Great Britain and Germany, which countries have an advantage of nearly 100 per cent. in cost of material and about 40 per cent. in cost of labor. This statement is very conservative, as it is based upon a comparison with the cost of labor and materials in Great Britain, whereas in Germany labor and materials are even lower than in Great Britain. Persons well informed in

the trade are bold enough to affirm that the time is not far distant when English manufacturers will be seeking protection against German importations.

Of the 16,000 laborers employed in this country about 75 per cent. can be classed as skilled labor. Many of the more skillful have been trained in their work from boyhood, and have acquired sufficient means to obtain comfortable homes. They are unfitted for any other trade or employment, and if, by reason of any diminution in the demand they were forced to become idle, great and serious results would flow to them and bring disaster and ruin to many happy and contented homes—a condition that could not be cured by seeking other occupations for which they are unfitted and unable to prepare themselves owing to want of skill and adaptability and local and family ties.

Notwithstanding the protection received, the result has not been injurious to the consumer. This fact is conclusively proved by the fluctuation in prices of pipes and tubes, which have varied according to the natural influences of trade. The excess of capacity over the demand, and the absence of any combination, pool or trust have stimulated manufacturers to excel each other in the cheapness of their goods and have caused a healthy rivalry in business, the benefit of which has been enjoyed by the consumer. This condition is likely to continue, as any increased demand would stimulate production, cause the silent mills to renew work and thus counteract the rise in prices.

Another and most important result of the protection hitherto enjoyed has been in the superior class of goods made in this country. The character of goods made in Great Britain, where most foreign pipes and tubes are produced, is inferior to our own, both in their crude and manufactured state. While the English make three distinct grades of goods for gas, water and steam purposes, grading the thickness, quality and perfection of workmanship according to the tests to which these goods are to be subjected in actual use, we manufacture one class, suitable for gas, steam and water; and, while it is true that our factor of safety, where goods are used for gas, is very much larger than necessity calls for, the consumer and the public derive the advantage of this precaution. It would, therefore, result in great injury to the public to mix the different classes of goods, either through the designs of dishonest merchants or the carelessness of purchasers. A change of system so long and so favorably established and known would bring chaos and confusion to the trade, as well as loss and danger to consumers. The English and Germans are noted for cheapness and the Americans for quality. It may be said that the superior quality of our pipes and tubes would afford some protection to our manufacturers and keep their rivals out of this market; but it is a well-known fact that advantage in price is a greater danger than advantage in quality is a protection. It will, therefore, be seen that protection benefits instead of injuring the consuming in quality.

Any demoralization of the pipe and tube trade in this country will react upon other industries. With us, as with almost all other trades and arts, there are many supplying materials, &c., with which we work. One of the mills represented by us (the National Tube Works Company) itself manufactures from 50,000 to 60,000 tons of iron and steel by three or four different processes, all of which is consumed in its own mill. This company employs in this branch of its business alone 2000 workmen. It also purchases as much more material from other rolling mills and forges. While all rolling mills and forges are not dependent upon the trade we represent

for their business, the strips of steel and iron used in pipe-making are of special form and size, and rolling mills are now engaged making this specialty alone, producing at least 500,000 tons annually, and employing about 22,000 workmen. We might follow the chain further back and consider the number of steel ingots, blooms, and the amount of pig-iron necessary to supply these rolling mills, but our purpose will have been accomplished if we have directed your attention to the intimate relation one branch of trade bears to another, and to the great injury that would result from crippling the manufacture of one line of goods, which in itself, as compared with the great total of iron and steel production, is comparatively insignificant; but when considered in the light of its effect upon trade and upon business, supplies the difference between success and failure. These interests are all kindred, and what affects one is sure to affect the other. A serious disturbance of the present relation must, therefore, injure many workmen, and impair many millions of capital. The closing of all the pipe and tube mills and kindred rolling mills in this country, could such a contingency arise, would cause at least \$100,000,000 of capital and 100,000 workmen to lie dormant and be idle.

The proposed tariff and classification differ from those in the existing law, those in the bill now before you, and your own suggestions as they have been conveyed to us. A frank consideration of the necessities of the case has warranted a revision and a substantial reduction provided the classification can also be adopted. The language used is justified by experience, as the present tariff can be, and, as we believe, is, being evaded by importers. For the purposes of ready comparison we copy the various provisions:

Present Tariff.—"Boiler tubes, or flues or stays of wrought iron or steel, 3 cents per pound.

"Other wrought iron or steel tubes or pipes, 2½ cents per pound."

Mills Bill.—"Boiler tubes or other tubes or flues or stays of wrought iron or steel, 1½ cents per pound." (Page 18, lines 247, 248.)

Proposed Senate Bill.—"Boiler tubes or other tubes or flues or stays of wrought iron or steel, 2½ cents per pound."

Our Classification.—I. Plain-end boiler tubes, flues or stays of wrought iron or steel, of diameters of (outside measurement) 2½ inches or less, 3 cents per pound.

II. Plain-end boiler tubes or flues or stays of wrought iron or steel, of diameters of (outside measurement) over 2½ inches, 2½ cents per pound.

III. Gas, water and steam tubes and all other classes and kinds of wrought iron or steel tubular goods having threaded, flanged or socketed ends (permanent or detached), 2 cents per pound.

IV. All tubular goods having plain ends, *i. e.*, no threads, screws, sockets or flanges shall be included in Classes I and II.

It will be readily seen that the recommendation we make has the merit of clearness and simplicity, although somewhat longer than any of the others.

By a curious coincidence the word "pipes" is entirely omitted from the Mills bill, and also from the first section of the existing law.

So quick is the foreign competitor to catch at these significant distinctions that German tubes have been imported and invoiced as *pipes*, thereby obtaining the advantage of the lower duty, and securing a market for their goods at prices against which it is impossible for our clients to compete.

We have presented these general views for your earnest consideration, without burdening you with a mass of statistics and figures to justify our facts; but should

you crave the confirmation we are prepared to give, and your patience and strength will permit you to peruse them, we will gladly furnish the data collected for the purpose of enabling us to present the views herein expressed. They warrant us in laying down the following propositions:

I. The system of protection in practice during the last ten years has stimulated the growth of the manufacture of wrought iron and steel pipes and tubes.

II. It has protected the home industry without injury to the consumer.

III. Home competition is now so active as to prevent unnatural and artificial prices and exorbitant profits.

IV. The addition of foreign competition would result in disaster to our home mills.

V. We cannot compete with foreign manufacturers.

(a) They have 100 per cent. advantage in the cost of material.

(b) They have at least 45 per cent. advantage in cost of labor.

(c) Their goods are inferior in quality.

VI. The present investments in manufacture were made on the faith of protection and an expectation of reasonable stability of the tariff.

VII. The home consumer has been benefited by a natural fluctuation in prices, and a superior standard of goods.

VIII. A radical change in the tariff would imperil the capital invested and injure the laborers, who must, of necessity, prosper or suffer according to the condition of trade.

These considerations warrant the appeal we submit, and in view of the reasonable concessions made in our recommendation, we confidently hope you will be justified in reporting them in the bill to be proposed by you to the Senate.

Grate Areas for Boilers.

The *Locomotive* directs attention to the fact that one of the greatest mistakes that can be made in designing boilers, and the one that is most frequently made of any, consists in putting in a grate too large for the heating surface of the boiler, so that, with a proper rate of combustion of the fuel, an undue proportion of the heat developed passes off through the chimney, the heating surface of the boiler being insufficient to permit its transmission to the water. This mistake has been so long and so universally made, and boiler owners have so often had to run slow fires under their boilers to save themselves from bankruptcy, that it has given rise to the saying, "Slow combustion is necessary for economy." This saying is considered an axiom, and is regarded with great veneration by many, when the fact is, if the truth must be told, it has been brought about by the wastefulness entailed by boiler plants proportioned badly by ignorant boiler-makers and ignorant engineers. Direct experiments have been made to settle the question. The grate under a certain boiler was tried at different sizes with the follow result:

With grate 6 feet long ratio of grate to heating surface was 1 to 24.4.

With grate 4 feet long ratio of grate to heating surface was 36."

The use of the smaller grate gave, with different fuels and all the various methods of firing, an average economy 9 per cent. above the larger one, and when compared by burning the same amount of coal per hour on each, 12 per cent. greater rapidity of evaporation and economy were obtained with the smaller grate.

The *Ironmonger* prints the following: "An example of the serious manner in which trade is hampered by high railway rates has just come under our notice, and may be mentioned in order to encourage

the movement which is in progress for securing improved water communication for certain of our inland districts. A firm in mid-England purchased in the United States 600 tons of American charcoal pig iron. That iron was produced at Elk Rapids, Mich., a place, as most of our readers are aware, several hundred miles west of New York. The iron was shipped to Liverpool at a freight rate of under 16/ per ton, including all dock and other dues in the United States. The distance thus covered was about 3800 miles, so that the freight charge was extremely favorable. The dock dues in Liverpool and the railway rate from Liverpool to the consignee's sidings, a distance of 80 miles, amounted to 11/ per ton, a charge which compares most unfavorably with the ocean freight."

The World's Wheat Supply.

According to a recent review in *Bradstreet's*, the world as a whole has wheat sufficient for the world's consumption in 1888-9, but on a higher plane of prices. The price may become speculative, may be carried too high, higher than the situation warrants, in which cases there will be reactions. From the information in hand it appears true that wheat supplies will be so much smaller than usual and that the reserves will be so much depleted as to warrant an advance in values. The higher freights ruling will be a factor in bringing about this result.

Europe's Wheat Requirements and Supplies.

	Bushels.
United Kingdom.....	155,000,000
France, probably.....	75,000,000
Spain and Portugal.....	10,000,000
Switzerland.....	10,000,000
Italy.....	20,000,000
Belgium.....	16,000,000
Holland.....	7,000,000
Sweden.....	1,000,000
Germany.....	18,000,000
Greece.....	5,000,000

The total will reach.....331,000,000

Russia will probably supply.....	90,000,000
Austria-Hungary.....	12,000,000
Egypt.....	3,000,000
Algeria.....	3,000,000
Denmark.....	2,000,000
Turkey, Roumania, &c.....	30,000,000
Persia.....	5,000,000
United States.....	90,000,000
Chili.....	4,000,000
Argentine Republic.....	8,000,000
British North America.....	10,000,000
Australia.....	18,000,000
British India.....	35,000,000
	305,000,000

Apparent deficiency.....26,000,000

But these estimates, both supplies and requirements, may need considerable modification. Any very considerable advance in the price would necessarily diminish consumption, as greater economy would be exercised, which would leave no real deficiency. It may be safely stated that there will be no wheat famine in the world during 1888-89.

The first full cargo of iron ever shipped north, says the *Atlanta Constitution*, was carried out last Thursday from Savannah, loaded for Philadelphia, on the new freight steamship City of Birmingham, of the Ocean Steamship Line. The iron came from Birmingham, via the Central Railroad of Georgia, and indicates the growth of the new industry in the South. The cargo consisted of 121 car loads, or 2072 tons of pig metal, and the steamer went out drawing 16 feet 8 inches mean draft. After discharging her cargo at Philadelphia the Birmingham will go to New York and load railroad iron for Savannah. While large quantities of pig iron have been going East via the Central Railroad and its ocean steamers from Savannah, this is the first full cargo that has ever gone from any Southern port.

THE WEEK.

The President has designated Lieutenant Jacob J. Hunker, United States Navy, as Supervisor of the Harbor of New York. He is to act under the direction of the Secretary of War in enforcing the provisions of the act to prevent obstruction and injurious deposits within the harbor and adjacent waters of New York City by dumping or otherwise, and he is to detect all offenders against this act. He is to direct the patrol boats and other means to detect and bring to punishment offenders against the provisions of the act.

Chairman Blanchard, of the Central Traffic Association at Chicago, pronounces the new Pacific Coast rates, which took effect September 1, unfair, and he advises shippers in the transcontinental trade to appeal to the Interstate law. Mr. Blanchard stated that he would not accept them, neither would the Eastern trunk lines. He didn't think the California roads had any right to make a lower rate from New York to San Francisco than from an intermediate point like Pittsburgh. These lines fall back on the winter clause of the Interstate law, and claim that under this act they are justified in making these unfair rates. As it is now, the Pittsburgh iron manufacturer, in shipping to the Pacific Coast, will find it cheaper by far to send his iron to New York and have it returned from there. The California lines say they will not withdraw the tariff, and Mr. Blanchard said the only way to settle the difficulty is to appeal to the Interstate Commission. He also thought that the Interstate commissioners should have more authority. The law is merely advisory at present, and the railroads cannot be forced to obey it. He believed certain changes should be made which would give the commission the authority to coerce the roads into obeying the letter and injunctions of the laws laid down by the Senate. He said further that the business done by the roads so far this year does not compare with the traffic handled in 1887.

The New York Corporation Council pronounces the law void which was passed by the last Legislature creating an office for the weighing of coal, being in violation of article 5 section 8 of the Constitution, which says: "All offices for the weighing * * * any commodity whatever are hereby abolished, and no such offices shall hereafter be created by law."

An English resident of Ecuador is about to establish a fortnightly steamship service, under Colombian colors, between Chilean ports and Panama, and the United States Consul-General at Panama believes it will be successful.

Three eminent Chinese engineers at New Orleans are examining the jetty system and are to decide whether it can be used advantageously in deepening the mouths of the Yellow River.

Charles H. Lichman resigned the general secretaryship of the Knights of Labor.

Jacob Souder, a prominent coal operator at Pottsville, and for many years sales agent of the Reading Company, was killed between the bumpers of the cars at Crystal Colliery on Friday last.

The contract for putting the city Fire Department wires underground was awarded to the Standard Underground Cable Company. The contract calls for an expenditure of \$47,717.25.

The advocates of the proposed East River tunnel are urgently pushing their scheme before the New York Board of Aldermen. The tunnel under the city streets would run through Thirty-eighth street from the East to the North River, with lateral branches connecting with the

New York Central and Hudson River Railroads. Everett P. Wheeler, representing the Long Island Railroad Company, said the tunnel will be 5 miles long, and will pay to the city in taxes \$50,000 a year. There will be an opening to the tunnel at every block, and access will be had to it by a system of commodious elevators. It is not proposed to run locomotives in the tunnel, but to use either electricity or cable as a motive power.

It is reported that the importers of tropical fruit have organized a trust in New Orleans. Six houses are in the combination, representing a total capital of \$10,000,000. It is said \$6,000,000 have been advanced by London parties to build railroads in Central America and concentrate the trade at selected ports.

Jute bagging as a covering for cotton bales has been considered indispensable, but a combination of the manufacturers to advance the price is resolutely resisted by cotton planters, and to such an extent that deliveries at shipping ports may be seriously delayed. The question excites deep interest on the New York Exchange, the legality of any substitute for jute bagging under the regular delivery contract being questioned. In New Orleans, according to one of the local papers, "the suggestion to use cotton cloth as a substitute for jute and hemp in covering bales of cotton appears eminently practical and wise from every point of view," but in some instances difficulty is encountered in effecting fire insurance.

The Contract Labor Committee authorized by Congress will resume its investigations about November 1, but the testimony already taken is voluminous, and, according to Representative Ford, has convinced the committee that something positive must be done. The laws relating to contract labor have been violated to an alarming extent because of the lack of machinery to enforce them. Italy is flooded with steamship agents who make false statements to induce emigration. One of the facts brought to light incidentally was that naturalization papers are being issued fraudulently to an alarming extent. It is very easy to get out these papers under our law; any one having access to the seal of a court can get them out and sell them. Another fact developed was that the New England fishermen are aliens to the extent of 75 per cent. As to the remedy, the committee have not agreed upon the form it shall take.

The annual report of the Commissioner of Pensions shows that the amount expended for and on account of pensions during the year ending June 30, 1888, was nearly 31 per cent. of the entire disbursements of the general Government. The amount of pensions paid during the year was \$78,775,862, an increase over the previous year of \$5,308,280. The total amount disbursed by pension agents for all purposes was \$79,646,146. The cost attending such disbursements was in the aggregate \$3,262,524, it being a fraction less than 4 per cent. of the total expenditures of the Bureau. The total amount expended for all purposes was \$82,038,386, being 21½ per cent. of the total estimated gross income of the United States Government for the period.

Mr. Jenner, of the British Legation, Buenos Ayres, in a recent report on the finances of the Argentine Republic and on the last Presidential message, states that the country is in a more prosperous condition than it has ever been before. As compared with 1886, almost every branch of industry and commerce showed an important increase in 1887. The total value of imports and exports rose from \$194,000,000 to \$218,000,000, and the first quarter of the current year shows an increase of \$4,000,000 over the same portion

of 1887. The number of vessels entered and cleared increased by 4000, with an increased measurement of 1,000,000 tons. The revenue in 1886 was \$46,762,000, while in 1887 it rose to \$58,135,000, and the excess of revenue over expenditure was \$6,217,000. The floating debt has been reduced by \$5,000,000, and about \$3,500,000 of Treasury bonds have been paid off. The credit of the Government with European banks is maintained by the deposit of a large number of shares of the Central Argentine Railway, but the President proposes to sell half of these, the remainder being sufficient to maintain the Government credit account in Europe. The external debt amounts to \$92,427,000, which the President calculates can be paid off in eight years. The Argentine credit, as shown by the quotations of the national bonds in the London market, is higher than it has ever been before.

In England, as in the United States, there is an increased demand for tonnage to be employed in the transportation of grain, so that shipowners are fast recuperating their weakened resources. A London circular relating to steamship tonnage says a large number of orders for new steamers have been given out, and several laid down on the strength of an expected further demand. Prices asked and obtained show about 5 to 15 per cent. advance on the lowest points touched, according to dates of delivery.

Judge Fairall has filed his opinion in the Iowa railway cases against the Iowa Railroad Commission, and in the test suit of the Chicago, Rock Island and Pacific Railway against the Commission, sustaining the injunction against the commission at all points, and quoting authorities to sustain his position. The Judge holds that the court has jurisdiction over the commission, and says that while the commissioners have discretionary power to fix rates, yet when they fix them so low that the earnings are thereby diminished to such a point that the company is unable to pay its fixed charges and operating expenses, then their act contravenes the spirit of the statute and is in violation of the constitutional right of the common carrier to a just and reasonable compensation and reward for his services. When the rates are not compensatory a court of equity has the authority to intervene. The Iowa Railroad appeal from Judge Fairall's decision will be heard at the October term of Court.

A retired iron manufacturer of Pennsylvania, Thomas Beaver, uncle of the Governor of the State, has erected and presented to the town of Danville, 50 miles from Harrisburg, a noble building called the Thomas Beaver Free Library. It was in Danville that the donor amassed his wealth in iron, and the institution stands as evidence of his regard for the people. The gift amounts to \$150,000. Of this sum about \$100,000 has been spent in the purchase of the ground and the erection of the building, \$10,000 has been used at once in purchasing books and \$40,000 of securities are given to the trustees as a permanent endowment fund.

The California vintage for 1888, as estimated by the secretary of the State commissioners, is 20,930,000 gallons, Napa and Los Angeles counties leading off with 3,500,000 gallons each. The raisin production is placed at 1,000,000 boxes or more.

Chief Arthur, of the Locomotive Engineers, on several public occasions lately has referred to the disastrous strike on the Chicago, Burlington and Quincy Railroad, and, at Pittsburgh, made a speech in which he said: "We are ready to submit the case to the arbitration of any three railroad managers in the country." Respecting the dynamite trial, he does "not

hold the Brotherhood responsible for a few weak men, whose actions were unauthorized," but there were "extenuating circumstances which trial will reveal." Mr. Arthur says the Brotherhood has a membership of 25,000 men and the firemen almost as many. He claims that morally and financially the Brotherhood has made great advances since it was organized, 25 years ago, when engineers got \$90 per month; firemen, \$30 per month; freight conductors, \$40 per month; freight brakemen, \$25 per month and passenger conductors, \$60 per month. To-day engineers get \$3.50 per run of 100 miles. Firemen get from 50 to 60 per cent. of that amount, and brakemen get \$4 per day.

Wm. Cramp recommends that the large war ships be built in dry docks and gives for his reason that they are too heavy to be built on stocks and that the risk of launching them without injury is very great. The dry dock now in course of construction at Newport News will be completed some time next month. Work on the Brooklyn and Norfolk docks is progressing rapidly.

The monthly chart just issued by the Hydrographic Office, at Washington, says in reference to the general understanding that now prevails among practical navigators respecting the northern and southern limits prescribed for steamers bound east or west in the Atlantic trade, that "this recent disaster would not have occurred had the Geiser been further to the southward, as recommended for eastward bound vessels, and the collision thus emphasizes the importance of this matter not only to owners, agents, masters and marine underwriters, but to the public generally."

The receipts of flour and grain at Buffalo by lake for the month of August aggregate 17,079,000 bushels, and for the navigation season 55,760,000 bushels. The railroad shipments to the East of grain received by lake are unusually large this season and aggregate 18,073,000 bushels to 19,711,000 bushels by canal.

The bow of the Thingvalla, which arrived at Halifax after her collision with the Geiser, is gone clean down to the keel, and from the collision bulkhead forward she must be built anew.

A Sugar Bounties Convention was held in London, August 30, at which nearly all the principal sugar-growing countries were represented, and the several delegates affixed their signatures to a document providing for the abolition of bounties for the manufacture and exportation of sugar. England agrees not to impose differential duties on cane and beet imports from the countries party to the convention. The countries signing the convention will exclude refined sugar, molasses and glucose coming from countries that have not signed the convention. The parties to the convention may be exempted from its operations by giving a year's notice, under certain conditions. The convention goes into operation September 1, 1891, and remains in force ten years. The trade in this city regard the negotiations as unlikely to result in any change affecting the American market.

The great trunk-line pool, of which Albert Fink is Commissioner, is reported to be so badly demoralized that its dissolution is probable, every effort to "fix up things" having proved futile. "Every line," we are told, "is making its own freight rates to all points; every passenger agent signs an agreement one day, only to break it the next, and when caught by one of Mr. Pierson's detectives the agent is called before the commissioner and asked for an explanation, whereupon a promise is made to reform, and the irregularities are continued." The further statement is made that "the Pennsyl-

vania is about to withdraw from the entire association unless it is abolished by mutual consent. Neither the Erie nor the Baltimore and Ohio pretends to live up to its agreements, and the managers of both agree that the present association is incapable. Every one is dissatisfied, and nearly all are in favor of saving the vast expense of the office, nearly or quite \$200,000 per year, and which, it is regretfully admitted, has not by any means succeeded in accomplishing its purposes. As yet there has been no positive course outlined so far as can be learned, but there is no doubt whatever as to the fact."

The annual report of Hon. Nicholas M. Bell, Superintendent of Foreign Mails, shows that of the Transatlantic mails dispatched in 1888 from this country 43 per cent. of letters and of postal cards and 51 per cent. of other articles went to Great Britain. Germany is next, with 21½ per cent. of letters and 20 per cent. of other articles. Then comes France with 6½ per cent. of letters and 7½ per cent. of other articles, and Sweden with 6½ per cent. of letters and 4 per cent. of other articles. The total number of letters sent from the United States to all foreign countries, including Mexico and Canada by rail, was 43,510,037. The total number of letters received from all countries was 38,451,364. The total cost of the foreign mail service was \$464,910. The estimate for 1890 is \$760,000. The compensation to Transatlantic steamers of foreign lines at the rate of 44 cents per pound of letters and 4½ cents per pound of printed matter was as follows for domestic mails: North German Lloyd, \$174,022.89; Cunard, from New York, \$88,385.17; White Star, \$14,204.76; Liverpool and Great Western, \$28,505.44; Anchor, \$5,094.40; Hamburg-American, \$14,628.76. The mails are awarded on the 15th of each month for the next calendar month to the steamers which show the greatest average speed for three trips immediately preceding the award, and under this system the mails have been materially expedited. With regard to subsidies to American vessels Mr. Bell says: "The policy of dispatching the mails by the fastest steamers tendered has met with so much favor with all classes of people that it at this late day they were deprived of the privilege of dispatching their letters by the quickest possible route it would undoubtedly create much dissatisfaction." The rates of compensation for sea conveyance of mails to foreign countries paid by Great Britain, Germany and the United States to national and foreign steamship companies is shown by the following table:

	To national steamers.			To foreign steamers.		
	Letters.	Prints, &c.	per lb.	Letters.	Prints, &c.	per lb.
Great Britain.....	72¢	6¢		44¢	4½¢	
Germany.....	56½¢	4.3¢		44¢	4½¢	
United States.....	\$1.00	8¢		44¢	4½¢	

The last span in the great bridge across the Hudson River at Poughkeepsie was finished on the 30th ult., and the event was duly celebrated.

The forthcoming annual report of the General Land Commissioner will show that during the last fiscal year there were made 59,095 cash land entries of all classes, aggregating 5,907,254 acres, for which the Government received \$11,203,071. The whole number of entries of all classes, including Indian lands, made during the year was 255,119, embracing 24,485,833 acres. The total receipts from the foregoing were \$13,523,185. Of the whole number of entries 46,236 were original homesteads, embracing 6,676,616 acres; 22,413 were final homestead entries, embracing 3,175,400 acres, and 24,572 were timber culture entries, having an area of 3,733,305 acres. During the year the land grant

railroads made 40,786 selections, embracing 6,525,300 acres. Under school, swamp land and other grants by the Government to the several States and Territories 8029 selections were made, covering an area of 1,265,452 acres. In addition to the 24,485,833 acres entered under the various public land laws during the year the area of commuted homesteads, final desert entries, final homesteads, and final timber culture entries aggregated 5,647,543 acres.

Labor Day was more generally observed in this city and in many other large cities than on previous like occasions. In New York the number actually in the public parade is variously estimated at from 3000 to 8500. The building trades were not so well represented, but of slate and metal roofers there were some 500, and of journeymen horseshoers there were 350 in leather aprons. The tin and sheet-iron workers were also in good numbers, and a steam drill in operation attracted much attention. At Troy, where the iron mills were closed, also in Albany, Boston, Cincinnati, Buffalo, Newark, St. Louis and other points, there were large processions. At Cleveland the iron molders forcibly pulled down a red flag, causing much tumult, and in this city one arrest was made for distributing anarchist circulars; otherwise good order was preserved.

St. Louis is to have a new union railroad depot, to cost \$500,000.

An actual beginning has been made in clearing New York City of dead wires and dead poles. As a substitute the Fire Department has already contracted for cables to enable it to avail itself of the underground service, and the Brush Electric Light Company are drawing their first cable into the Broadway conduits, while the East River Electric Light Company have ordered an underground cable which is to be ready within ten days. Of the 1700 lines of wire entering the Central Telegraph Station in London not one is above ground.

It is now estimated that the new library building in Washington City, if built in accordance with the plans adopted, will cost \$10,000,000, so that all calculations heretofore made are thrown into confusion.

It is charged that millions of feet of Canadian lumber are smuggled into the United States free of duty. A letter from Calais, Maine, says: "The St. Croix River, with its source in the timber lands of Maine, forms a natural waterway from the logging camps to the mills. Further north the St. John River is used for the same purpose, though on the latter the logs are to a great extent manufactured in the interior of New Brunswick and shipped via St. John. The logs floated down the St. Croix are manufactured into lumber at the mills along its banks, of which a majority are situated on the Canadian side. These mills, at Frederickton, Edmonston, Woodstock, Deer Lake, Benton and Magaguadavic, all in New Brunswick, and a number of others near Calais, approachable only from the Canadian side, are the stations for the vast amount of lumber that has been illegally entered free of duty at Calais. During the last quarter of the fiscal year ending June 30, 1886, of a total of over 6,000,000 feet of lumber entered at the port of Calais, over 3,000,000 feet were admitted to free entry as original product of American forests."

Ten large business houses in Baltimore were destroyed by fire on Tuesday morning. Among those burned out were the hardware merchants H. S. King & Sons and Tabb Brothers & Dimmock, whose losses respectively are estimated at from \$40,000 to \$45,000.

MANUFACTURING.

Iron and Steel.

Recently the report has been extensively published that the Jackson Iron Company, of Fayette, Mich., were considering the advisability of removing their furnace plant from its present location, in order to secure better facilities for obtaining fuel. We are authoritatively advised that there is no truth in the rumor whatever. The company are making extensive improvements to their plant at the above place, with the intention of considerably enlarging their capacity for the manufacture of charcoal pig iron. They have no intentions whatever of moving from their present location.

The plant of the Stewart Iron Company, Limited, at Sharon, Pa., which has been idle for some time, resumed operations in full on Monday, the 3d inst., for the manufacture of steel blooms, with 13 puddling furnaces in operation. Employment was given to about 40 hands.

All departments of the Atlantic Iron Works of P. L. Kimberly & Co., Limited, at Sharon, Pa., are now in full operation, with the exception of the bar mill. Employment is given to a large number of hands.

Winona Furnace, of the Columbus and Hocking Coal and Iron Company, in the Hocking Valley, Ohio, which has been undergoing repairs for some time, has resumed operations again.

Steel rails weighing 90 pounds per yard have recently been rolled in the rail mill of the Bethlehem Iron Company, at Bethlehem, Pa., for use on the Philadelphia and Reading Railroad.

The Bellaire Nail Works, at Bellaire, Ohio, are running full in all departments, except the nail factory, which is still idle. Some embarrassment has occurred by shortage in gas, but nothing serious, as the appliances for using coal were not discarded when gas was put in. The blast furnace is making its usual output.

Frankstown Furnace, at Frankstown, Pa., operated under lease by James Pierpont, has been levied on by the sheriff on executions issued by G. W. Jackson & Co., J. R. Reynolds and W. F. Reynolds. The furnace has been in operation about two years, and was making about 20 tons per day.

A press dispatch from Youngstown, Ohio, under date of the 28th ult., reads as follows: "J. N. Whitman, of Syracuse, N. Y., the owner of a patent process for rolling hoop iron, is here negotiating with local capitalists in regard to erecting a mill for the manufacture of his specialty. His process, by which hoop iron can be rolled to any desirable length, and automatically rolled instead of bundled, has been tested at the Warren Rolling Mills and has proven satisfactory. It is likely that a mill will be established here."

Mill No. 2, of the A. French Spring Company, Limited, at Pittsburgh, which was recently damaged by fire, is again in operation, the repairs having been made.

The second furnace of the De Bardeleben Coal and Iron Company, at Bessemer, Ala., is to blow in at an early date.

Moorhead, Brother & Co., of Pittsburgh, proprietors of the Vesuvius Iron and Nail Works, located at Sharpsburgh, Pa., are adding a new heating furnace to their plant, which is an addition to the guide rolls. The motive power, which has heretofore been insufficient, has been increased by another engine, which has just been erected. The present run of the works turns out a greater amount than has ever

been known before, though formerly the mill has been on double turn in every department. Since the new improvements have been added the daily output is about 125 net tons, while the raw product of muck bars is little more than 50 tons a day.

The Belfont Iron Works Company, of Ironton, Ohio, who closed down their plant about two months ago to make extensive repairs, have started up again full time in all departments. During the stoppage one gas-producing furnace and two heating furnaces were added to the plant. They were constructed by Alex. Laughlin & Co., engineers and contractors, of Cleveland, Ohio.

The Gadsden Furnace (coke), at Gadsden, Ala., is to blow in on the 10th inst.

Wm. Clark's Son & Co., proprietors of the Solar Iron Works, at Pittsburgh, are about to place in their puddle department a rotary squeezer of 50 to 60 tons weight, which is to be driven by a reversing engine, so that in case of a "sticker" the ball can be backed out. The machine is being constructed by the Lewis Foundry and Machine Company, Limited, also of Pittsburgh.

It is stated that an effort is being made to start up the plant of the Cartwright Iron and Steel Company, at Steubenville, Ohio, which made an assignment about two months ago. The works were formerly known as the Alkanna Rolling Mill. The unsecured claims amount to \$45,000. Some of the heaviest creditors now propose that the company give long-time notes for 40 per cent. of the indebtedness in full satisfaction of the same, the notes to bear 6 per cent. interest. Then the company will spend \$10,000 in making betterments to the plant and resume operations. The plan is likely to be accepted by the balance of the creditors as a possible means of making good a portion of their claims.

Norway Furnace at Bechtelsville, which went out on the 23d ult., has begun to re-line, and will probably start late in October.

Katherine Furnace at Carlisle, Pa., went into blast on the 29th ult.

Some months ago the Carbon Iron Company, of Pittsburgh, secured control of the Fort Pitt Iron and Steel Works, in that city, and have since been busily engaged in making extensive additions and changes at the plant with the object of making the manufacture of structural steel a specialty. Horace W. Lash, formerly with Park Brothers & Co., Limited, of the Black Diamond Steel Works, was secured as general superintendent. Mr. Lash is the inventor of the well-known Lash steel melting furnace. The company have just finished the erection of an open-hearth steel-melting plant consisting of two 15-ton Lash steel melting furnaces, and have commenced the manufacture of steel. They have also put in a large universal mill that was completed on the 1st of September to furnish universal rolled plates 36 inches wide of any length or thickness required for structural purposes. Also slabs from 6 to 30 inches wide, and from 2 to 6 inches thick, and blooms from 4 to 8 inches square. The mill has been run to work down its bearings.

Emma Furnace, of the Union Rolling Mill Company, Cleveland, Ohio, was blown in on the 30th ult.

Crafts Furnace, at Greendale, Ohio, one of the furnaces of the Columbus and Hocking Coal and Iron Company, has blown in.

The extensive improvements now being made to the Soho Furnace of the Moorhead-McCleane Company, at Pittsburgh, are rapidly approaching completion, and

when finished the furnace will have a capacity almost double what it was before the improvements were commenced. The bosh has been increased from 16 to 19 feet, and height of stack from 65 to nearly 90 feet. Along with the increase in diameter and height, the further improvement of fire-brick stoves in the place of cast-iron stoves has been made, and other changes of minor character, but so many of them as will in the aggregate add greatly to the convenience and economy of operating. It is expected that the furnace will be ready to commence operations about October 1, next.

Fannie Furnace, operated by J. C. Hamilton, Shawnee, Ohio, trustee, will resume operations in a few weeks. A new bosh has been put in, general repairs have been made, and a new brick casting house, 37 x 85 feet, is being put up to replace the old one recently destroyed by a wind storm.

Walton Furnace, charcoal, at Max Meadows, Va., one of the plant of the Lobbell Car-Wheel Company, of Wilmington, Del., was blown in on September 1.

Machinery.

At the recent sale of the assets of the Smith, Beggs & Ranken Machine Company, of St. Louis, John D. Ranken, a member of the firm, purchased the realty, buildings, tools and patterns for a sum slightly exceeding \$63,000. Stock, finished and partly finished, and other minor assets, will be sold later on.

Eynon & Marshall, engine builders and machinists, of Cleveland, Ohio, are receiving numerous orders for their slab-milling machine. On account of an increase of orders the company have been compelled to erect a new factory, which they expect to occupy in November next.

The American Manufacturing, Mining and Milling Company, of Cleveland, Ohio, have just completed the erection of a 50-ton crushing and concentrating plant for the Humboldt Mining Company, at Lordsburg, New Mexico.

P. F. Goode, proprietor of the American Nail Machine Company, at Ashtabula, Ohio, has signed a contract for the removal of his establishment to Findlay, Ohio, and has already let the contracts for the new buildings, which are to be large and commodious and will be completed in November next. When completed the new works will give employment to about 150 skilled workmen.

The Oakland Iron Works have been incorporated, at Oakland, Cal., with a capital stock of \$50,000, to manufacture machinery, milling supplies and foundry work of all kinds. The directors are George Cottrell, T. L. Armstrong, Edward Clark and others.

Messrs. Curtis & Curtis, of Bridgeport, Conn., manufacturers of the Forbes patent die stock, pipe cutting and threading machinery, are still running overtime in their new works. Their July shipments were the largest of any month since they have been in business, but they overran even this in August, when the shipments exceeded those of July by over \$500. They are particularly busy filling orders for their power pipe machines, among which are orders from South Africa, Texas, Montana and San Francisco.

The Cleveland Twist Drill Company's new works are progressing rapidly. They expect to get into the buildings on November 1. The main building is 100 x 40 feet, with tempering and forge shops adjoining. New machinery will be added to keep up with increase in business.

Messrs. Lodge, Davis & Co., Cincinnati, Ohio, expect to have the addition, now being erected, to their plant fully com-

pleted by September 15, when they will have 6000 square feet of floor surface devoted to manufacturing purposes. Their business has more than doubled in volume within the past few years. August was the largest in point of business in the history of the establishment.

Hardware.

The Iron City Chain Works, of James McKay & Co., on Twenty-ninth street, Pittsburgh, resumed operations on Monday, the 27th ult., after a stoppage of nearly two months to make repairs. Orders at this establishment are reported as being rather scarce.

The Baltimore Nail and Screw Company have been incorporated at Baltimore, Md., with a capital stock of \$15,000, to manufacture nails and screws. The incorporators of the new enterprise are Joshua J. Underhill, James T. Armstrong, George C. Galch, William S. Dorman and Jacob S. Barnes.

The Empire Wringer Company, Auburn, N. Y., advise us that while their sales in 1887 were larger than ever before, the sales to July 1 this year show an increase of 25 per cent. over the corresponding period of last year. They have enlarged their facilities somewhat since January 1, but the factory is now closed for necessary repairs, but will start up again with some new machinery and an additional force in a few days.

Miller Lock Company have removed their office and works to Frankford, Philadelphia. The new location is an advantageous one in many respects, more especially in the matter of working space and shipping facilities. The new plant is located on Tacony street, below Orthodox, the dimensions of which are 100 x 200 feet, with two-story factory 50 x 84, and foundry 20 x 40. The company inform us this step was necessary on account of the constantly increasing trade, which often taxed their facilities in the old plant to make seasonable deliveries. With their present capacity they are in a position to readily meet double the demand of the past year.

Miscellaneous.

From the Marquette, Mich., *Mining Journal*, of the 25th inst., we take the following: Lake shipments of iron ore for the week ending with Wednesday, the 15th, amounted to 202,384 gross tons. Of this total 49,564 tons went from Marquette, 82,804 tons from Escanaba, 3138 tons from St. Ignace, 52,076 tons from Ashland, Wis., and 14,802 tons from Two Harbors, Minn. The lake shipments for the season now amount to 2,431,330 gross tons, or within 219,782 tons of the quantity shipped at the corresponding date in 1887. By ranges the shipments are as follows: Marquette range, 950,305 tons; Gogebic range, 711,562 tons; Menominee range, 579,147 tons; Vermillion range, 190,316 tons. The following table shows the shipments by port up to date this season in comparison with the shipments for the corresponding portions of the two preceding years:

Port.	1888.	1887.	1886.
Marquette.....	402,328	499,306	553,488
Escanaba.....	1,172,875	1,232,787	886,397
St. Ignace.....	68,671	55,460	41,689
Ashland, Wis..	597,140	652,018	401,146
Two Harbors..			
Minn.....	190,316	211,442	180,227
Total.....	2,431,330	2,651,112	2,071,947

The Gorham Manufacturing Company, silversmiths, of Providence, R. I., have begun the erection of a monster factory in Elmwood, a western suburb. The big factory will consist of 12 buildings, to be completed a year from next November. There will be a little short of one mile of foundations. The main structure will be 419 x 256 feet, two buildings will be 419 x 225 feet and each will be 44 feet wide and

three stories high. The main preparatory building will be 225 x 80 feet, one story, and here will be carried on the heavy press and drop work. The exhibition room will be 200 x 65 feet and two stories high. The buildings are all to be of brick, with granite and brown stone trimmings. About 1300 hands will be employed.

A press dispatch from Charleston, W. Va., under date of the 28th ult., reads as follows: "The property of the Boone & Raleigh Coke and Coal and Railroad Company, and of the Black Band Iron Company, consisting of 3690 acres of land, was sold to-day to L. B. Russell, of Lynn, Mass., for \$250,000."

The Avonmore Coal and Coke Company, of Pittsburgh, with a capital of \$10,000, were chartered at Harrisburg last week.

The Perry Stove Mfg. Company's works at South Pittsburgh, Tenn., 20 miles west of Chattanooga, are again overtaken by disaster, the boiler having exploded early on Monday morning, September 3. Six men were instantly killed, among whom were Charles Taylor, the superintendent of the works, J. B. Mills, a machinist, M. Donovan, foreman of the mounting department, George N. Carter, a leading jeweler of the town. The boiler and engine were in the corner of the molding room and the whole side of the building was torn away for a distance of 40 feet.

The S. Obermayer Foundry Facings and Supply Mfg. Company, Cincinnati, have again been compelled by reason of their largely increased business to erect an additional structure to their already large plant in the nature of a new ware and storage house, the dimensions of which are 121 by 82 feet. The new structure, when completed, will enable the company to devote more space to the production of their goods.

Two notable buildings are in course of erection in New York. Perhaps the most interesting piece of work now in progress is the office building which J. Noble Stearns is erecting at Nos. 50 and 52 Broadway and Nos. 41 and 43 New street. It will be the highest structure on the same width of ground which has ever been erected. It will be 13 stories in height on Broadway and 15 on New street, and when completed will enjoy the distinction of containing more stories than any other office building in the city, and probably in the country. It will also have the curious reputation of having been built upon a lot which has only a frontage on our greatest business artery of 21.6 feet, while it will be 39.4 on the other side, with a depth of 159.7. The construction is exceptional, the building being carried up to the fifth story with iron, the stories above being of brick. It will be fire-proof throughout, and cost about \$225,000. The architect is Bradford L. Gilbert. The most expensive down-town building in progress is that being erected for the Bank of America, on the northwest corner of Wall and William streets. It is to be nine stories in height, 70 x 80 in size, and perfectly fire-proof. The front will be of stone, the first two stories of granite and the seven floors above of Indiana limestone. The architect, Chas. W. Clinton, estimates that the new structure will cost complete about \$400,000. To the foregoing may be added the *Times* building, fronting City Hall Park, whose lofty arched walls are reaching a conspicuous elevation.

One of the late fast train runs from London to Edinburgh was made in seven hours and fourteen minutes, exclusive of stoppages, at an average speed of 55.4 miles an hour.

NEW PUBLICATIONS.

THE LIXIVIATION OF SILVER ORES WITH HYPOSULPHITE SOLUTIONS. By Carl A. Stetefeldt. Published by the author, 18 Broadway, New York. Price \$5.

The penetration into greater depths of our mining operations in the Rocky Mountains, coupled with the possibility of treating leaner ores, has considerably enlarged the field of the metallurgist, and the old days of the "muscular amalgamator," as Mr. Stetefeldt calls him, are fast passing away. He is being superseded by men who have at their command both theoretical training and practical experience, a class of whom the author has been a pioneer and is still the acknowledged leader in this country. When some years since Mr. E. H. Russell, then connected with the famous Ontario mine of Park City, Utah, discovered that a solution of a double salt of cupreous hyposulphite and sodium hyposulphite acts powerfully as a solvent of silver and its compounds, Mr. Stetefeldt took an active interest in developing the possibilities of what is now known among silver metallurgists as the Russell process. Both the inventor and Mr. Stetefeldt freely published the results of their investigations in contributions printed chiefly in the "Transactions of the American Institute of Mining Engineers." The work was thorough and painstaking, its latest fruits being given to the public in the work before us, which may well serve as a model of special metallurgical treatises.

It would carry us too far to discuss in detail the contents of the book, since the subject is one in which but few of our readers are directly interested. Suffice it to say that Mr. Stetefeldt treats in the first part the chemistry of the process throwing a clear light upon many formerly obscure and neglected points, largely upon the basis of special experimental researches. The second part deals with the practical execution of the process, including a description of plant and appliances, the points to be considered in connection with the solutions, the handling of the ore and the liquors, the precipitation of the metals dissolved and the treatment of the sulphides resulting therefrom. He gives notes on the construction of the plant, its cost and the expenses of running a mill, and, finally, goes into a comparison of the new process as compared with amalgamation as shown by actual results obtained at a number of mills. Mr. Stetefeldt's is a standard work which has met with well-deserved praise by those interested in the metallurgy of silver.

A Winnipeg dispatch reported that the Manitoba Legislature ratified the agreement with the Northern Pacific Railroad by a vote of 26 to 10, five supporters of the Government being among the minority. The main feature of the document is the transfer to Northern Pacific control of the Red River Valley Road from Pembina to Winnipeg, and the extension of 51 miles from Winnipeg, which the Government is now building. The Northern Pacific agree also to build a line from Winnipeg 135 miles northwest to Portage la Prairie, and guarantee a very low maximum rate on freight from Northwestern points to Duluth.

The Island of Cuba, Edgar La Wake-man says, in a letter to the *Republic*, offers a splendid field for the culture of coffee. One-half of the southern slope of the island is cultivable as the finest coffee lands of the world.

Collector Magone at this port is showing more vigilance in returning paupers to Europe.

The Iron Age

New York, Thursday, September 6, 1888.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
 CHAS. KIRCHHOFF, JR., - EDITOR.
 GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
 RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
 JOHN S. KING, - - - BUSINESS MANAGER.

Protection and Progress.

Mr. David Wells, who certainly cannot be fairly suspected of a tendency to underestimate the importance of the tariff question, has shown, in a series of striking articles on the economic disturbances of the past 15 or 20 years, that a cause has been operating, in the presence of which tariffs, currencies, banking systems and economic legislation of all kinds are relatively insignificant—so insignificant, in fact, that it is scarcely possible to detect their effect in the experience of this or that civilized country, during the period named, in modifying the effects of the greater, deeper and more general cause. The one thing that can be declared of the unparalleled economic disturbances of this period is, that they have affected different nations in proportion to their advancement in civilization, as measured by the use of machinery. This fact alone is sufficient to indicate, what is abundantly susceptible of proof in other ways, that this main cause has been the almost revolutionary progress of every branch of industry, and the astonishing reduction of cost in every department of production and exchange. A very large proportion of the invested capital of civilized nations has thus been destroyed, and a very large proportion of their industrial laborers has been forced to change of employment, with the inevitable result of a visible increase of the number who are, at a given moment, temporarily out of employment.

These stupendous changes are the sudden result of a century of invention and preparation. As the rains on the upper tributaries of the Nile, swelling hundreds of streams at once, produce a flood in the main stream that comes on like a tidal wave, so innumerable labor-saving contrivances and scientific discoveries, new applications of steam and electricity, new enterprises like the Suez Canal, new materials like petroleum and natural gas, have combined with well-nigh catastrophic results; and thousands of men, both rich and poor, have had sad experience of the irresistible nature of Progress.

It is not true, as Mr. George insists, that this world-wide force tends to increase poverty. It is not true that of the greater wealth produced the laborer gets less than ever. On the contrary, the manual workers are those who have been most benefited; and it is capital which has suffered the greater loss, and receives, and will continue to receive, a diminished gain. We need not travel again the well-worn road of this demonstration. Starting from the proposition that progress is a good thing, we wish to point out some relations between it and protection, the importance of which has been overlooked; and under the head of protection we include the patent laws and the tariff.

Let it be remembered that this progress which has produced such immense results

in recent years has been general throughout Christendom. Our proposition is, that the patent laws and the protective tariff of this country have been important factors in it. We do not concern ourselves at this time with any other relations of either factor. We do not purpose to discuss them "on their merits." We shall simply indicate facts which ought to be taken into account in such a discussion.

The principal means of the progress we are considering is the interchange of ideas. Free trade in these is worth more, to producer and consumer alike, than free trade in anything else could possibly be. This principle lies at the foundation of patent laws. It is recognized that society will be the gainer if a man who has devised a new and valuable improvement in any art will tell plainly what it is, instead of keeping it as a trade secret, perhaps to die with him. Consequently he is paid for making public what he would otherwise conceal. A monopoly is granted him—a monopoly which is, in this country, more absolute in its nature and longer in its term than in any other. At the end of its period the public inherits the advantage of a free use of his invention. During the period it is directly his interest to explain it, to demonstrate it, to advertise it and to introduce it as widely as possible in practice. This stimulates other inventors in the same line to seek similar rewards. With all the defects in administration which characterize the American patent law, it must be admitted that it has been a chief cause of the extraordinary fertility of invention among us. And the principal reason is that American inventors are so well rewarded and protected that they would rather take the absolute monopoly offered them by our laws for 17 years than try to protect themselves by secrecy. Important trade secrets are rare among us. Everything patentable—in other words, everything new, useful and capable of the necessary precise description—is patented, and so made public. The resulting revenue is poured for a while into the pockets of the monopolist and his grantees, but the intellectual treasure, the contribution and the impulse to progress, is bestowed instantly upon the public. The protection of the patentee against home competition makes him communicative, and this communication of new knowledge is cheaply bought by the community at the price of a monopoly.

Now, the protection against foreign competition afforded by a tariff has a similar effect. The reason that an English ironmaster traveling in this country can obtain easy access to all our great establishments, see anything they contain, watch all their operations and obtain analyses, samples and drawings, while an American in England or on the European Continent finds it hard always, and impossible often, to obtain such facilities, is that our manufacturers do not fear that their improved methods adopted abroad will come back to plague them with competition. Of course the Belgian or British manufacturer has in most cases no fear of direct American competition, and Americans will be admitted if anybody is; but the danger that valuable secrets of practice may thus leak out and get to the knowledge of the enemy is often too important to be trifled with, and hence "No

admittance" is inscribed upon the door. These deficiencies are not due half as much to any national characteristics as to the features of the business situation as determined by international commercial competition. It is often said that if all barriers were removed American ingenuity would enable us to compete on equal terms with foreign rivals. Those who say this overlook two things: First, that to be effective in competition such ingenuity must operate secretly; secondly, that to keep secrets from foreigners we must keep them from each other, and that this would destroy the very atmosphere of free interchange of ideas in which our national ingenuity has been bred. It is not an inherent quality in our blood which must find expression. Foreigners who come among us manifest it speedily enough. As a factor of progress it is the product of our laws, and it may be nullified by changing the conditions which now favor it.

To complete our demonstration it remains to show that the two agencies of protection above named operate internationally to produce and to accelerate progress. If our contention be true, we ought to find not only that within our own country the free interchange of ideas favored by protection has rapidly improved industrial practice, but also that the dissemination of American ideas abroad has been exceptionally free and wide, and has perceptibly affected foreign practice. This we shall undertake to show in another article.

Proposed Restoration of a Central American Union.

The necessity or desirability of reuniting the five Central American republics is so universally felt that a serious effort is to be made this time to bring about the event, and lay down the foundations for a permanent union. With the example of regenerated Mexico at their doors and the Panama Canal work still going on in the neighboring Colombia at the south, and the revival of a Nicaragua Canal scheme, Central Americans feel that the time has come for a strong State to hold the balance of those two nations. The feeling is strengthened, moreover, by the harmony at present existing between the five republics and their respective presidents. Costa Rica has in this instance taken the initiative, and in a month or two a Central American Congress is to assemble at San José de Costa Rica for the purpose of framing the new compact. The first union lasted from July 1, 1823, to 1840. On February 28, 1885, General Barrios, President of Guatemala, issued a proclamation attempting a restoration; finding, however, that there was not the response he counted upon, he invaded Salvador with an army and fell in the first engagement, at San Lorenzo, on April 2. One of his generals, Francisco Menendez, continued the war, and seized the Presidency or rather Dictatorship of the invaded State. He has remained the President of Salvador ever since, and, after a short, desultory warfare, peace was restored throughout Central America. The absorbing individuality of General Barrios having disappeared, there seems to be no further obstacle.

The main staple produced in Central America is coffee, which since 1885 has risen so much in value that the planters

have grown rich, and prosperity has extended over the length and breadth of the land. The finances have vastly improved, indebtedness has either been reduced or consolidated at a lower interest, and railroad building resumed. In fact, the combined public debts of the five republics do not reach \$30,000,000 silver to-day, and with a joint population of 3,000,000 the new Union would owe less money relatively than any country south of us, while its credits abroad for the prosecution of public works would not fall much short of that of Chili. In other words, both American and European capitalists would undoubtedly be eager to complete the Central American railroad system if the new State were to allow some subsidies or merely guarantee the interest on railroad bonds issued by private companies. A prosperous, strongly constituted State, with the prospect of continued peace, would indeed have greater loaning power than the five comparatively poor republics as they stood in 1885.

The census of 1880 showed the population to be distributed as follows:

	Area. Kilometers.	Inhabit- ants.
Guatemala.....	121,140	1,357,900
Salvador.....	18,720	634,120
Nicaragua.....	133,800	259,794
Honduras.....	120,480	323,274
Costa Rica.....	51,760	213,785
Totals.....	445,900	2,788,873

Indians form a large portion of the population, but they are peaceful and industrious, and constitute a valuable help on the coffee estates. Although immigrants from Europe would be welcome, and find a healthy climate on the great plateau and mountain slopes, Central America can dispense with them. Even on the low lands the climate is so salubrious that the American surveying expedition in Nicaragua did not lose a single man; there was even a total absence of sickness, although they were often busy in the swamps. There is not a plant indigenous to tropical America which does not flourish in that part of our continent. At the same time, the mineral resources, of Honduras in particular, are magnificent. American capital is largely interested in mines, gold especially, and has been in railroads for 15 years past, in Costa Rica notably. Our trade has been as follows:

Import.	
1886.....	\$5,966,769
1887.....	8,426,491
Domestic Export.	
1886.....	\$2,467,632
1887.....	3,668,506
Totals.	
1886.....	\$8,434,401
1887.....	12,094,997
Increase.....	\$3,660,596

This increase is equal to 44 per cent. It is due, chiefly, to the rise in coffee and increased prosperity, calling for more American goods. San Francisco also does a large Central American trade, both import and export. There are few, if any, countries with which our trade increases as rapidly, especially now that the fruit business is being entirely transferred from sailing vessels to steamers.

Everybody, besides, wishes the Nicaragua Canal enterprise good success. This time it is systematically pursued; all the necessary preliminary steps have been taken, nor will there be a lack of capital. The canal will not be a work so expensive that there will be a necessity for appealing to

European capitalists; all the money that is wanted can be procured among us, and it will be an essentially American enterprise. It does not matter whether the Panama Canal be abandoned or not, for there will be traffic enough for both. At any rate, what we have shown will suffice to prove the growing importance to us of Central America, and the deep interest which the union movement has for us.

The Advance in Old Rails.

The rapid advance in the price of old iron rails in the West, which occurred in the third week in August, was one of those surprises in the iron trade which confuse the wisest. There had been some premonitory symptoms, it is true, but they were of a character to be accounted for in almost any condition of the market by a mere temporary increase in the demand. The price had fallen steadily from the beginning of the year, when they were sold at \$21 to \$22 at Chicago, until \$17.75 was touched in the middle of June, and \$18 to \$18.50 seemed like a very fair price to both buyer and seller. Up to that time old rails had been neither scarce nor yet over plentiful in the Western market. The supply was about equal to the demand, and prices simply moved in sympathy with the fluctuations in the value of other iron and steel. But when the lowest price named was realized there was a sudden revulsion as though bottom had been struck and a reaction was imminent. It is possible that if the Western rolling mills had not been just then on the eve of stopping to enter the fight for the wages scale for the coming year the rise in price would have taken place at that time.

This was an unfortunate suspension of animation in the old-rail trade for some of those interested in it. They misunderstood the exact situation of affairs, and presuming that another downward plunge would follow they either took contracts at ruling prices for future delivery or deferred purchases to fill old contracts until prices were lower. Herein they erred, but they were no more mistaken in their forecast of the market than their colleagues who refused to purchase at the prices offered and to take the chances of unloading at a higher or lower price in August or September.

Those who "went short," however, at \$18 to \$18.50 were unable to cover their contracts without loss in July, and when August came they found the Western rolling mills their active competitors in bidding for all available lots of old rails. The most active demand and the most decided upward movement in prices occurred in the third week of August, when a sudden jump was made from \$21 to about \$24 at Chicago. No warrant seemed to exist for such a sudden advance beyond the one very important fact that the supply of old rails was limited, but this was by no means a new discovery. It was known as well in June as in August. The rolling mills starting up needed a supply of material, it is true, but the condition of their business would hardly seem to justify the payment of 25 to 30 per cent. more for it than they were paying when they shut down. For a time rumors were current in the West of a combination of capitalists endeavoring to "corner" the old rail supply, but diligent

inquiry develops circumstances totally at variance with such a scheme. The "short" contracts taken when old rails were very cheap were hardly of sufficient importance to influence the market, although the efforts of the parties to cover became an interesting feature of the rapid advance. A speculative movement has developed, too, as the result of the existing condition of affairs, and some lots are being held in the West which the owners state that they do not propose to sell until the spring.

Other materials have begun to appreciate in value, either in sympathy with old rails or from the same cause which advanced their price, whatever that may be. The concurrent conditions of the general iron market may therefore favor the continuance of the higher rates for old rails which have been established, especially as the supply has apparently grown no more plentiful since the advance. As the price of new steel rails and old iron rails represents a difference of but \$6 to \$7 per ton, it would seem to be a very good time for railroad companies to make renewals, as a very small expenditure of cash would be required, unless they have now but a limited mileage of iron track in use. This is an important consideration in prognosticating the future course of old iron rail prices. The supply must, in the nature of things, get less and less every year with the exclusive use of steel rails for new tracks and renewals. Possibly this very year has been the first in which the long-expected curtailment of the supply of old iron rails has made itself manifest.

The English Naval Maneuvers.

The recent British naval maneuvers have shown England's naval forces in a pitiful light. So persistently have her war vessels been held up by every one as models of what modern fighting ships and cruisers should be, and so confident have always been the official statements of high speeds, that the accounts of the first completed performance will, no doubt, be surprising to the general reader. We have always held that the trial-trip speed schedules, according to which warships are customarily rated, are not only untrustworthy, but seriously misleading, and give no assurance whatever that a vessel listed as a 15-knot ship, for example, can ever attain this speed in regularly running. The trial trips, as conducted, last only from four to six hours; with this short time even the contract speeds can be maintained and the ships made to fill the stipulated requirements only with the greatest care, straining everything to the utmost. The most favorable conditions, moreover, are secured during these trials, conditions in part, which are rarely, if ever, realized in regular service, and the ships which go forth as 14, 16 and 18 knot vessels, as the case may be, are in truth anything but the promising specimens as which they are represented. It would perhaps be difficult to obtain a more striking demonstration of the truth of this than the maneuvers in question. The failures, as given in the available accounts, were of two kinds, all the ships, with one or two exceptions, having shown themselves to be much slower than claimed, and the machinery having in many cases broken down or got out of order. The slowness of the ships

was indeed something surprising, though the general state of inefficiency was none the less marked, and is graphically portrayed as follows, by the London *Engineer*.

We have no very definite information on the matter as yet, but enough is known to prove that little dependence can be placed on the marine engine in the navy. We do not speak now of torpedo-boats, but of large ships. Admiral Baird doing his best to get to Dover was severely hampered on the way. On Saturday Admiral Baird took his six fastest ships, leaving behind him what ought to be a powerful force to join him as soon as possible. The utmost that could be got was a pitiful 9 knots. The old Northumberland did this with two boilers to spare. The boilers of the Shannon were in trouble, and the Northampton could not keep up; when asked to get on a little quicker she telegraphed that she was doing her best. The inflexible broke down with her starboard engine and dropped astern, still keeping her port screw going. On the preceding Wednesday the big ends of the Neptune's connecting-rods began to knock so hard that, although the enemy was believed to be in sight, she had to go into Holyhead for four hours to take up the slack. Seeing that the ship has not steamed 500 miles continuously, this seems a strange state of affairs. Next the Shannon blew the packing out of her high-pressure piston-rod gland, and she had to stop for half an hour.

Truly a remarkable condition of things. Had all these mishaps occurred in actual warfare our English cousins would have been badly handled. But comment is scarcely necessary. The facts, as presented, speak for themselves and certainly do not add to the glory of the British navy.

Waterways and Railways.

The new Railway Regulation act passed by the English House of Commons makes some decided changes in dealing with the difficult subject of transportation regulation. It provides that freight rates on the canals shall be reduced by the commissioners whenever it shall appear that they are made unjustly high by the railways. This is so worded because the railways in England have acquired ownership of many of the most important canals, and have so arranged the water tariffs as practically to divert traffic to their own rail lines. It was the opinion of the House of Commons that the merchants should have the benefit of water competition, if necessary, under compulsion of law.

The question of water and rail competition is an old one, but has lately called out more discussion. Waterways are to-day receiving great attention from the governments of Continental Europe. It is proposed to make the already fine rivers of Russia, Austria and Germany more capable of carrying a large freight traffic, while there are many proposals for artificial canals—such as the one to connect the Baltic with the North Sea. In the United States we have already had deep sea conventions to urge the necessity of a suitable port upon the Gulf of Mexico and the importance of the matter to the citizens of Colorado and other Western States, as well as the one more immediately interested—Texas. It is undoubtedly true that the days of usefulness for short and disconnected canals have passed away. Such waterways not forming parts in through routes cannot compete with the railroads, but the case is otherwise where such great through lines by water can be established. There is no danger of the commerce of our

lakes falling into permanent decay, nor, indeed, upon any canal or river connecting with them, except from neglect on the part of the Government and the people directly concerned.

Are such rivers and canals, supported at public expense, unnatural and unjust competitors with railroads? Facts do not show any real ground for this assumption. At first, indeed, we see the waterways taking from the railroads, by reason of lower prices, a certain amount of business which, were it not for the waterway, would go by rail; but the loss is not a real one. There are certain articles which for successful manufacturing demand the lowest possible rate per ton, a rate which for any distance the railroads, under our present circumstances, can scarcely be expected to quote, or if they do, it is under compulsion. But these raw materials once moved at the cheap water rate, there arise large manufactories which give to the railroads carloads of finished product, tons of freight to and fro at comparatively high figures, breadstuffs and supplies to the tradesmen and finally a large passenger travel. All these advantages to the railroad arise from the establishment of a manufacturing center, whose profits in turn may depend upon the cheap water carriage of its raw material. Under such conditions it is an economic error to give undue prominence to the cheap traffic lost to the rail carrier without regarding the far more valuable tonnage at higher rates which these conditions secure to it. It is in the long run no disadvantage to a railroad to have even severe water competition; the situation of many of our most thriving railroads confirms this view. If this be the true view to take of the establishment or maintenance of connecting waterways, it follows that the opposition to them on the part of our transportation men is not dictated by a far-sighted policy, and their evident distrust of the first effects of water competition should be allowed only its due weight in considering the enlarging of our water system. What will benefit the manufacturer and dealer will in the end benefit the carrier also. Here, too, appears the error in allowing the railroads to buy up and abandon or but partly use their competing canals. The Pennsylvania Railroad has followed English precedent in this respect, as we think to its own detriment as well as to that of towns and cities interested. At least no more of our waterways should pass into railroad control without carefully guarded provisions as to operation. This, then, is the justification for the spending of money by the Government, either State or national, upon improved and cheaper means of transportation. It is a public work which, if done in reason and with a wise policy, must inure to the benefit of all our interests, our railways being included.

The law of compulsory insurance of workmen against injuries in Germany has now been in force for over two years, and ironmasters in that country are getting into a position of being able better to count the cost. The results of such an investigation are not calculated to make them very contented with the law or to lead them to look with equanimity at the efforts to force them to acquiesce in the proposed act providing pensions for work-

men. A recent issue of *Stahl und Eisen* contains some very instructive figures. When the insurance act was passed the Government presented estimates to show how the payments for compensation to men injured at work might be expected to grow, taking the sums paid in the first year as the unit. Tabulated, the progressive increase is as follows:

1st year	1.00	17th year.....	19.67
2d "	2.48	20th "	21.88
3d "	4.00	45th "	32.07
10th "	13.10	76th "	33.22

The increase from year to year is, of course, due to the growing number of men receiving compensation for injuries rendering them invalids. Now, for the first 15 months, from October 1, 1885, to December 31, 1886, the money paid to injured workmen was 67,111.98 marks in the association of iron and steel works of Rhenish Prussia and Westphalia, the largest branch in the country. The number of men insured was 70,313, on an average their total wages for the 15 months being 83,841,224.71 marks. In 1887 the sum paid was 226,347.09 marks on 72,101,410.79 marks wages paid to 74,179 men. These figures are exclusive of the cost of administration, 43,753.20 and 35,014.65 marks respectively, and exclusive of payments to reserve fund, which was 201,356.94 marks for 1885-86 and 452,694.18 marks for 1887. Per capita the damages, exclusive of cost of administration and reserve fund payments, were 0.95 marks in 1885-86 and 3.05 marks in 1887, while per 1000 marks of wages the payments for compensation to workmen injured footed up to 0.80 marks in 1885-86, rising to 3.14 marks in 1887. It is this rate of increase which is staggering to German ironmasters contrasted with the official estimates. The sum is nearly four times greater during 1887 than during 1886, instead of being less than two and a half times greater. If the present rate goes on German ironmasters will soon have to pay 2 per cent. of the wages earned for damages for injury sustained, exclusive of the cost of administration.

According to reports on the industrial situation in England, made to the London Board of Trade, there is every indication of a moderately prosperous autumn and winter, in pleasing contrast to those of the last three years. Seventeen trade societies have reported that of their membership of 186,120 persons 7000 are unemployed. During the past month the proportion of unemployed workmen reported has fallen from 5 to 4 per cent., in comparison to 9 per cent. unemployed at this time last year. The industrial situation is not up to that of seasons of really good trade, but is steadily improving.

M. Nathan, of the firm of Swarts & Nathan, among the most prominent Chicago wholesale dealers in old iron, returned on August 29 from a four months' trip through France, Germany, Austria and Russia. He received a most flattering ovation from his friends and business acquaintances on his arrival home.

Contracts for materials for the armored steel cruiser Maine were awarded as follows: Calvin A. Baynon, New York, screws, \$396; Rowland A. Robbins, New York, wrought iron, lead, zinc, tin, hardware, varnish, ship chandlery and leather, \$14,475; J. J. Donovan, New York, nails, locks, hinges, linseed, sperm and lard oils and alcohol, \$1834.

CORRESPONDENCE.

The Influence Of Aluminium Upon Cast Iron.

DETROIT, September 1, 1888.

To the Editor: My attention has been called to a criticism of my tests, by Mr. A. E. Hammer, on page 318 of *The Iron Age* of August 30.

The question as to the influence of the contained silicon is a fair one, but, as against my published results, he makes positive statements regarding the effect of very small percentages of silicon upon my white cast iron, is it not fair for me to demand of him experimental proof of his statements?

He evidently is not familiar with the characteristics of this white iron, containing only 0.03 sulphur and 0.186 silicon, when he says that "the carbon is near the balance—that is, near the point where it will readily assume either the combined or the graphitic form," and his erroneous statement that my iron contains 0.3 sulphur makes his assumption vastly more wide of the mark. Until he produces experimental proof to support his statements, the only way for me to disprove them is to give results from my own experiments.

He states that 0.02 per cent. of silicon would produce a perceptible change, and that 0.44 per cent. would be sufficient to account for the gray grain and the taking out of chill that I ascribe to aluminium. The facts are that this white iron is most persistently white, and the result of a large number of experiments with this iron shows that such balance as he speaks of is not reached until 2 per cent. of silicon is added, and it took 3 per cent. to produce the effect upon the carbon as to color of the casting which was produced by the 1 per cent. of aluminium. In taking away the tendency to chill, 1 per cent. of aluminium left $\frac{1}{4}$ inch chill, while 2 per cent. and even 3 per cent. of silicon was required to bring it down to $\frac{1}{8}$ inch.

I stated in my paper that "silicon and aluminium work together in the same direction," but all of my experiments prove that with this white iron such small percentages of silicon as he mentions produce no appreciable effect upon grain, chill, shrinkage or fluidity, and that until about 1 per cent. of silicon is added the result is not sufficient to be seen, and then not enough to be measured. Understanding perfectly the effect of silicon on this white iron, I knew that even 0.44 per cent. would not influence the metal enough to affect the measured results of the influence of aluminium.

I do not think it can be proved by experiment that this small percentage of silicon which he names would produce the effect that he claims—or, in fact, any effect whatever—although by inference we have a right to assume that any amount of silicon does produce a corresponding effect. I endeavored in my paper to state plainly that the crucible might give up or the metal be deprived of much larger percentages of silicon than he mentions, and that, therefore, on account of these errors in the most carefully conducted experiments, none but general conclusions can be drawn. The error due to these small percentages of silicon, added with the aluminium, is less than the error I have spoken of, and neither of them alone, or added together, is sufficient to materially affect general results.

The gray iron that I use for tests has its carbon on the balance that he speaks of, and for delicate tests I use this iron. It was to this and not to the white iron that I added the 4 per cent. of aluminium. It gives $\frac{1}{4}$ inch chill; 3 per cent. of aluminium took out all chill, but with twice that amount of silicon there still remains a chill. So far as blowholes are concerned,

some of the effects of small percentages of silicon may be measured by the increase in strength to resist weight and impact. What my experiments prove, is that aluminium acts in this manner.

In the short time that I had at my disposal I treated only of the influence of aluminium. When Mr. Hammer calls for a publication of more facts, does he not forget that he has met the facts that I have already published by mere suppositions? I shall soon be ready to publish the results of a very large number of carefully made tests, to show the influence of silicon upon cast iron. And, in the meantime, if I have not given a complete answer to the objections raised, I shall endeavor to give further information.

W. J. KEEP.

OBITUARY.

C. P. BUCKINGHAM.

Gen. Cartherinus P. Buckingham, president of the Chicago Steel Works, of Chicago, died at his residence in that city on the 30th ult., after a brief illness. He was born in 1808 at a small village called Springfield, near Zanesville, in Muskingum County, Ohio. His father was a merchant, and his mother was Catharine Putnam, daughter of Gen. Rufus Putnam. He graduated from the United States Military Academy at West Point in 1829, standing third in a class of exceptionally bright students. Entering the Topographical Corps of the Army, he was detailed after a year's service to West Point as Assistant Professor of Natural Philosophy, which position he resigned a year later to fill the chair of natural philosophy in Kenyon College, at Gambier, Ohio. He removed to Chicago in 1856, and in connection with Solomon Sturges built the Illinois Central grain elevators. In 1861 he re-entered the United States Army, was made Brigadier-General, and was selected to perform delicate and important functions in connection with raising troops, locating arsenals, &c. He resigned shortly before the close of the war and for several years was engaged in the elevator business in Brooklyn, N. Y., removing to Chicago in 1868 to assist his brothers John and Ebenezer in managing the elevators he had himself built. In 1873 he and his brothers established the Chicago Steel Works, which have been successfully operated by them from that time until the present. These works are among the few mills in the country making a specialty of manipulating old steel rails and putting them into merchantable shapes, for which they use machinery of original and very ingenious design. Under General Buckingham's active supervision, with the cordial co-operation of his brothers, this machinery was perfected and the works have steadily grown in importance, their products being used in the leading plow and other agricultural manufactories throughout the West.

Reports of the Edinburgh meeting of the Iron and Steel Institute, just at hand, show that, as expected, no matters of startling interest came up. The most valuable paper presented was that of R. A. Hadfield, of Sheffield, on the manganese steel with which his name is coupled, and a description by Daniel Adamson of a testing machine. A number of Americans took part in the discussions, among them T. C. Clark, of the Union Bridge Company; Capt W. R. Jones, of the Edgar Thomson and Homestead Steel Works, and Dr. T. Sterry Hunt. The latter spoke, too, in reference to the proposed meeting in this country, but as the institute is to go to Paris next year, the visit has been further postponed.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., September 4, 1888.

The caucus of the Republican Senators has materially changed the programme of that wing of the higher branch of Congress. At the gathering at Senator Edmunds's residence last Wednesday night, it was determined to shorten the time for hearing of representatives of the industrial interests to ten days, and the Sub-Committee on Finance have since been faithfully working up to that point. It is now confidently expected that the whole bill will be reported to the full committee by next Tuesday. Senator Beck, though next to Senator Voorhes on the Democratic side of the committee, is really the active leader on the tariff. He said to-day that he could not say what the policy of his side of the committee would be on the bill when reported there, for the reason that the Republicans had not yet permitted them to see it, nor had they said anything to them as regards even an outline of the measure. He said it might only receive a *pro forma* opposition in committee, reserving the main contest for the floor of the Senate. He said he would know more about that after he examined the bill. He admits that there will be a lengthy discussion in the Senate. The Democrats there will stand upon the platform of the Mills bill and will attempt to show that it is not a free trade measure, nor a stride in that direction, but purely a movement to reduce the revenue.

The bill as it stands makes no material changes in the metal schedule neither in raising duties where they should be nor lowering them where it can be done. Steel rails are scheduled down to \$15, but even this may be changed. The chief grounds of difference have been on the lumber, wool and sugar schedules. An increase of duty of one cent on the finer grades of wool has been assented to in the sub committee, and lumber has been allowed to remain unchanged, but sugar comes in for a 50 per cent. cut, which is objected to by the Kansas Senators on account of the sorghum interests of their State. The sugar reduction would foot up but \$30,000,000, and the balance of the reductions proposed would be more likely to increase than decrease the revenues, so that the rest must come from internal revenue. Senator Allison says that the bill which will be reported will receive the united support of the Republicans, but the length of the debate and the time of its passage will depend largely upon the course of the Democrats. They will be accorded full swing in discussion, and when they get through a vote will be taken.

The passage of the bill in the Senate will be followed by conferences and non-concurrences, which will depend entirely on the amount of time consumed upon the obstinacy of the conferees and the disposition of the two Houses to enter into much of a debate on the conference reports. After one or two disagreements the House may refuse to appoint conferees, which will bring matters to a standstill. This may lead to a recess or an adjournment some time in October. The tariff question is remote from being settled as far as legislation in this Congress is concerned. It is more likely that the representatives now in nomination for election to the Fiftieth Congress will have that knotty question to deal with. The 6th of November will determine whether Mr. Mills or a Republican committee will prepare the bill for that Congress to dispose of, and whether Grover Cleveland or Benjamin Harrison will exercise the Presidential power of approval or veto.

Recent Legal Decisions.

PROMISSORY NOTE—PAYMENTS MADE TO AGENTS.

Q. gave his note for \$800 to H., but did not pay it, and H. placed it in T.'s hands for collection. T. was a lawyer, and in the course of the month H. advanced more money to Q., and took a note for the whole sum due. Q. fell into the habit of paying the interest on the note to T., though the note was made payable at the Bank of California, and he, also, made a payment on account of the principal to him, all of which payments were sent to the Bank of California. The payment on the principal was credited on the note but the interest was not indorsed. T. did not have the note in his possession when the payments were made, but H. knew that Q. was making the payments under the impression that T. was still his agent. H. transferred the note to his daughter, after its maturity, but did not give Q. any notice that he had done so. Suit was brought to enforce the payment of the note, and Q. sued to restrain its collection, he having paid in full to T., but he was defeated. H. carried the case—*Quinn vs. Dresbach*,—to the Supreme Court of California, where the judgment was reversed. Judge Hayn (of the Commission of Appeals), in the opinion, said: "It was negligence in H. to allow Q. to act in the belief that T. was authorized to receive payments on the note. He, H., knew that T. was acting in some way as his agent in making these collections, for the bank knew this, and the knowledge of the bank, which was H.'s agent, must be imputed to him. Here T. had ostensible authority to act for H.; it would not be supposed by H. that he was acting for Q. Ostensible authority is defined to be 'such authority as a principal, intentionally, or by want of ordinary care, causes or allows a third person to believe his agent to possess.' The fact that the note was not in the possession of T. does not change the result. The want of this possession is a circumstance to be considered in determining the question of authority, but is not conclusive. The fact that the bank held the note for collection would not prevent the owner from collecting it himself. And the transfer to H.'s daughter gave her no right, the note having matured, her father did not have, as no notice thereof was given to Q. The judgment must be reversed."

PROTEST—PRESENTMENT.

M. H. and T. H. made their note March 11, 1884, payable in 10 months, with F. as nominal payee, E. being the actual payee. E. indorsed the note, and both he and F. put over their names "waive notice and protest." The note was dated at Belleville, Kan., but the H.'s did not live at Belleville, nor did they receive their mail there. The note was not paid, and in the certificate of protest it was stated that the note was presented to the H.'s at Belleville for payment, and that it had been refused; that notice of dishonor had been sent to the H.'s in an envelope, postpaid, directed to Seaps and Concordia, Kansas, respectively, and that at the same time the same notice was sent to E., directed to Belleville. E.'s post office address was not known, and, in fact, neither he nor the H.'s got the notices sent. An action was brought on the note against E. and the H.'s, and E. depended on the ground that there had been no demand made on the H.'s and that he had had no notice of dishonor. Plaintiff had judgment, and E. carried the case—*Davis vs. Eppher*—to the Supreme Court of Kansas, where there was an affirmation. Judge Holt (of the Commission of Appeals), in the opinion, said: "1. The residence of the maker

being unknown, it was sufficient that the note was ready for presentment at the place where it was made. 2. Notice was properly sent to E., at Belleville, his residence not being known. 3. The waiving of notice and protest made the indorsers absolutely liable without protest or notice."

INNKEEPER—LIEN ON GOODS OF DRUMMER.

D. was the traveling salesman or "drummer" of N., and he carried with him trunks and packages of samples of the goods he was selling. He stopped at the hotel of C. and there ran up a bill of board, on which, from time to time, he made payments. The account was extended over the greater part of the year. No information reached N. of D.'s default in payment until after the debt was incurred, when he found that the innkeeper held the samples under claim of a lien thereon, on the ground that N. was liable for the bill, as it was made by D. in the course of the work done for N., as his agent. N. had recovered the sample goods in an action therefor. N. refused to pay the balance of D.'s bill when C. demanded payment, and an action was brought therefor—*Covington vs. Newberger*—and the plaintiff recovered. N. carried the case to the Supreme Court of North Carolina, where the judgment was reversed. Judge Davis, in the opinion, said: "The plaintiff relies upon the implied promise of the defendant to pay this debt. He seeks to establish his liability by the rule that where a principal sends his agent through the country to sell goods for him the principal gives the agent, by implication, authority to bind him for all charges incurred in the performance of his duties. Conceding this rule to be well settled, can it be easily assumed that it is within the scope of the agent's authority to make debts and charge his principal therewith? He was employed to sell goods, and it may be that all reasonable and necessary expenses (whether he be furnished with the money by his principal to pay or not) as he travels through the country may be an implied charge against his principal as a necessary incident to the business of the agency; but this must be within the limits and subordinate to a well-known custom. But the plaintiff has testified that it was the general custom of transient patrons, as D. was, to pay cash for their bills. There were exceptions, he said, but he did not show that this case was an exception. The long and continued failure of D. to pay his bills for board in full, according to the general custom, ought to have put plaintiff on inquiry; and he should have gone to his principal with notice, else he put himself open to the charge of collusion with the agent against the principal. It is insisted by plaintiff's counsel that if he cannot hold N. for the debt, still plaintiff had a lien on the goods in possession of D. for the hotel charges, he being a guest, unless he knew the goods to be the property of another. But assuming that plaintiff had notified the defendant that his agent had failed to pay for his bill, and assuming that a lien would then arise to bind the goods for the bill, still, if the innkeeper allowed the agent to take the goods away, though he brought them back again, and extended the credit given for board from time to time to the agent, as the amount here indicates, he would have no lien for the amount of the unauthorized credit on the goods of the principal. The judgment was reversed."

ACCOUNT STATED—MISTAKES—DELAY IN OBJECTING.

H. rendered to M. his account against him, and the latter held the account without objection for three months. An action was brought to recover the balance stated to be due, and M., in his defense, attempted to show that mistakes had been made in stating the account; but the Court ruled against this evidence, and H.

recovered a judgment. The case—*Hendy vs. March*—was carried to the Supreme Court of California, where the judgment was affirmed. The case was decided by the Commission of Appeals, the judgment of which was approved by the Supreme Court. Commissioner Hayne, in the opinion, said: "The delay of three months to object to the account is a sufficient acquiescence in its correctness, and such acquiescence is an admission that the account is correct. Between merchants at home an account which has been presented, and no objection made thereto, after the lapse of several posts, is treated, under ordinary circumstances, as being by acquiescence, stated account, and between merchants in different countries a rule founded on similar considerations prevails. But the defendant contends that even if this is the case, he is entitled to show mistakes made in stating the account. The answer to this is this: An account stated becomes a contract, for an account stated alters the nature of the original indebtedness, and is itself in the nature of a new promise or undertaking. Therefore, an account stated with a new firm may include debts due to a former firm, or to one of the partners. An action upon an account stated is not founded upon the original items, but upon the balance ascertained by the mutual consent of the debtors and creditors. If there is any mistake in the contract thus created it must be made, as in any other case, an issue in the pleadings, and tried upon that issue; it cannot be shown as a defense to the original indebtedness."

PARTNERSHIP—FRAUDULENT CONVEYANCE BY PARTNER OF HIS OWN PROPERTY.

S. & R., merchants, were indebted to S., S. & Co. for goods sold and delivered to them, and they became insolvent. S., one of the debtor firm, conveyed to J. J. S., who acted in good faith, certain land, in consideration that he would pay his individual creditors \$3500, the amount of their claims, they accepting J. J. S. as their debtor for S.'s debts. The property had a possible value of \$4600, or \$1000 in excess of the consideration got. S., S. & Co. brought suit to set aside this conveyance as fraudulent as to them as creditors, and they had judgment. The defendants made a case on appeal, *Smith vs. Sely*, to the Supreme Court of Indiana, where the judgment was reversed. The chief justice (Mitchell), in the opinion, said: "When it is established that a grantee has taken a conveyance of a debtor's property under circumstances which make him guilty of positive fraud, and the transaction is fraudulent in fact, the conveyance will be deemed absolutely void as to the grantor's creditors, and will not be permitted to stand even as an indemnity for any payment the grantee may have made. If, however, a court of equity finds that property has been purchased from a failing debtor without any positive fraud upon the part of the purchaser, and yet under such circumstances as make it a highly injurious act and inequitable as to creditors that the conveyance should stand as a conveyance, it may be set aside on such terms as will protect a purchaser whose purchase is only constructively fraudulent. In the one case the transaction is fraudulent in fact, and the conveyance is utterly void as to creditors, and cannot be permitted to stand for any purpose; in the other the conveyance is fraudulent by construction of law, and is set aside upon consideration of public policy only, and then upon the condition that the equities of the purchaser, who was guilty of no actual fraud, be protected. The conveyance in this case, if fraudulent at all, is constructively fraudulent only; and equity must be done to the grantee. It is our opinion that the conveyance should not be disturbed. There was but a barely possible margin of \$1100 on the property, taking the highest esti-

mated value, and when we consider that an honest debtor in embarrassed circumstances is sometimes compelled to sell real estate under its value, and that honest purchasers are not compelled to pay the highest value possible, we are unwilling to concur in the conclusion arrived at by the court below, that the conveyance ought to be set aside as constructively fraudulent.

Mill Roofs.

Although the constructive features of mill roofs are well defined there is a wide diversity of experience and opinion with regard to roof covering. The extract which we give below, from a lecture on "The Evolution of the Modern Mill," delivered a short time ago by C. J. H. Woodbury at Sibley College, will therefore prove specially interesting.

The present form of factory roofing, says Mr. Woodbury, resembles a floor in its construction, being made in a similar manner of plank laid upon beams which project through the walls, where they act as a bracket to the cornice, the ends being sawed after any suitable ornamentation. The inclination for such roofs is about $\frac{1}{4}$ inch to the foot. Where a mill is narrow enough for a single beam to reach from the wall to the ridge they form cantilevers, the second point of support from the wall being by the columns one-third of the distance across the mill, and the ends of the beams are further secured together by means of iron dogs. For mills of greater width the beam would reach only to the row of columns, and over the middle of the mill a beam is placed, usually horizontal on the under side, and hewn down from the middle to each end, so as to preserve the same slope on the upper side of the beam as for the roof. In many instances mills are built with brick cornices, without any of the wood projection from the side, and in other buildings the walls are carried above the roof, which slopes toward the center, and all water falling on it or melted from the snow is conducted from it by pipes leading down through the middle of the mill. It is not desirable to place gutters around the edge of the mill as they serve no useful purpose and are in continual need of repairs. By leaving the edge of the mill plank square and protecting it by sheet metal flashing the rain falling from the roof can be received by a concave walk of coal tar concrete placed on the ground around the building. Suitable porches over doors, or some guard on the roof at these points, will prevent people who may be passing in at doors from being unduly wet by water from the roof.

There are numerous forms of roof coverings, the use of the different varieties being to a great extent local—that is, the sheet-iron coverings used in the Middle States are almost unknown in New England, and in the latter place the ordinary tinned iron roofing is universally painted, while in the Dominion of Canada it is laid obliquely and never painted. It is conceded by all that the sheet copper forms the most desirable method of covering a roof, and if one could be assured of the permanence of the structure, irrespective of the necessity for making changes every half year in order to keep pace with the march of invention, it would doubtless be shown that under such conditions of permanency copper would form the cheapest roof. The most widely used roofing materials for this class of buildings are the asphalt and the coal-tar roof, the latter being the most widely used in New England. There are numerous varieties of these composition coverings, which are applied by various methods. Some of these are of the most satisfactory character, while others are poorly designed and unskillfully

applied, and are a constant source of trouble and expense to the occupant of the building.

One of the leading manufacturers, the efficiency of whose work for many years over a large amount of mill property I can vouch for by personal knowledge, uses the following method of applying the roofing: Three layers of roofing felt are placed on the plank parallel to the eaves, and continued by lapping each additional layer two-thirds of its width upon the preceding one, and in this manner covering the roof with three thicknesses of the felt, breaking joints. This is secured to the roof by nails through tin washers and coated with a melted composition, and then two additional layers of felt are placed over the whole. Another coat of composition is then applied and gravel is placed over the whole while soft. This maker does not approve of the practice of cementing each sheet of felt when it is laid, because it does not allow the felt freedom to yield from the expansion and contraction of the roof. When tin is applied to roofs, rosin-sized building paper should first be laid on the roof plank, and the sheets of tin should be painted on the lower side before being laid.

Of late years cotton duck has been applied as a roof covering, and has been watched with a great deal of anticipation, although it has been used for similar purposes in covering ships' decks for many years. But the two uses are not strictly comparable, because the ship's deck is calked tight, and therefore the covering is free from the application of moisture underneath, while the roof is never tight, and the warm air underneath, heavily charged with moisture, which permeates the cracks between the planks, becomes chilled and condenses as it nears the top, carrying on a process of distillation. As an example of the extent to which this can be carried on, I have known of instances where people presumed they were making a good roof by leaving slight air spaces by means of the furring laid between the roof plank and the top boarding. The circulation of air in these spaces deposited sufficient moisture to rot the boards. A mill manager, wishing to have a roof over a very warm room, which should be both tight and a very perfect non-conductor, made a roof containing a space of about 16 inches, which was filled with sawdust, and the roof boarding on top of this was covered with tar and gravel in the usual manner. In a few weeks the water began to drip through the ceiling as if the roof was leaking, although there was no snow on the top of the roof. Investigation showed that within that short time a sufficient amount of water had condensed with the sawdust to saturate the whole. I would say in this connection that 3 inches of plank afford an ample protection against condensation over any ordinary process of manufacture, although 4 inches of plank have been used as a roof over paper machines in order to be safe beyond peradventure; but it is necessary that nails should not be driven into the bottom of this roof plank, because the point of a nail will reach to a lower temperature near the outside of the roof in the winter, and being a better conductor, it will cause moisture to condense upon the head of the nail.

Tin roofing is so general in use as not to require any allusion to methods of application, but the only course to reach economical and satisfactory results for a term of years, especially for locations near to the seashore, is to use the best quality of dipped roofing plates of some brand which can be relied on as conforming to the standard and free from "wasters" or imperfect plates. Duck roofing has been successfully applied by first laying and tacking down a covering of two-ply asphalt paper, and upon this was spread a

covering of rosin-sized sheathing paper, tacked in the usual manner. Upon this was laid a covering consisting of cotton duck, 44 inches wide and weighing 26 ounces to the yard. Several methods of joining the edges of the duck together have been tried, resulting in the abandonment of the method of sewing used, for the preferable method of nailing the duck down, laying one strip over the other, and then opening the duck, a lock joint is formed without any jointure between the two sheets exposed to the weather. After the duck is stretched on the roof, it is securely fastened by means of round-headed wood screws, $1\frac{1}{4}$ inches long, through a concave tin washer $\frac{3}{4}$ -inch in diameter, resting upon a $\frac{1}{2}$ -inch washer made of roofing felt. A coat of hot pine tar with a small quantity of linseed oil is laid upon the whole of the duck roofing, after being laid, for the purpose of filling the fiber and preserving the cotton fabric by means of the antiseptic principles of the pine tar. The surface is then covered with two coats of mineral paint.

Within a year paper has been very successfully used as a roof covering. Sheets of wood pulp board about $\frac{1}{8}$ inch in thickness are treated by a process which renders them hard and elastic, and secured upon the roof by means of tacks through concave tin washers. The edge of each sheet is grooved, in order to allow for the expansion and contraction of the roof. The whole roof is then covered with a heavy mineral paint. Experience with this during the past severe winter in Maine has been of the most satisfactory nature. Shingles furnish a much better roof covering than slate, both in the matter of conduction of heat or cold in the extremes of summer and winter and also in resistance to fire. The heat of a slight fire underneath the roof will cause slates to crumble, and the same result will be obtained by heavy sparks falling and burning upon the roof. Some people treat shingles by boiling them under pressure in a solution of salt and chloride of lime for the purpose of antiseptic treatment and also to render them fireproof.

A better class of sugar machinery is much needed in some parts of Brazil, where, as a rule, the machinery employed for extracting the sugar is of a very primitive description, and although the sugarcane contains 14 to 16 per cent. of saccharine, the manufacturers often obtain no more than 6 per cent. Lately, however, owing to the competition of beet-root sugar, the want of improved machinery has been very keenly felt, and here and there large establishments are springing up furnished with modern machinery, which has been mostly imported from France. These companies are generally formed with a capital of 1,000,000 francs to 1,500,000 francs, and, notwithstanding the low prices of sugar, are able to pay a dividend of about 10 per cent.

Minneapolis claims to be the champion wheat depository of the Northwest. The receipts at that point for the crop year ending August 31 were 47,109,490 bushels. This is said to be the largest quantity of wheat ever received in any primary market in the world. When it was announced last year that 39,278,380 bushels had been received in Minneapolis it was said the record would never be equaled. This year the increase is 7,831,110 bushels.

Three important industrial exhibitions open in the West this week. Columbus, Ohio, led off with its Centennial on Tuesday, followed the next day by the opening of the annual exhibitions at Chicago and Milwaukee. Exceptionally attractive features are announced at all of them.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., September 4, 1888.

Pig Iron.—The market has shown a considerable amount of firmness during the past week, and, while prices show no quotable change, the tendency is gradually in the direction of higher figures. Scarcity is perhaps the most prominent feature of the market. There is a disposition to sell within moderate limits and not much of a desire to force a higher range of prices. The conditions are such that any slight falling off in other markets would immediately influence us, hence Philadelphia is inclined to follow an advance rather than to lead one. In the meantime prices are relatively as low, if not lower, than in almost any other market, so that holders, as may be expected, are very firm. There is no urgent demand; consumers are taking 30 or 60 days' supplies at current rates, which is about as much as sellers are willing to enter for the present. Bids at current rates have been made in some cases for lots deliverable during the next six months, but they have not been taken into serious consideration. There is evidently more interest manifested in the market than for a long time past, and while most people expect an improving condition of affairs, there is not much chance of any material advance in prices. It is thought that 50¢ to \$1 per ton would bring in a good many furnaces, and those who are now in blast are not disposed to make a market, which would, perhaps, only lead to a higher cost and increasing competition, without any corresponding increase in consumption. Of course, if the position really calls for a larger production it will be impossible to prevent an advance in prices, but the trade are not inclined to make advances until it is seen that they are fully warranted. Meanwhile sales are being made at about last week's prices, say \$16 @ \$16.50 for Gray Forge, \$17 @ \$17.50 for No. 2 Foundry and \$18 @ \$19 for No. 1, tidewater delivery, or its equivalent. Nothing doing in Southern Irons; the much-talked-of cargo of 2000 tons, recently delivered at this point, was chiefly to close an old contract made by Justice Cox, Jr., & Co. for one of the large Pipe concerns in New Jersey.

Foreign Iron.—Nothing doing in this department, although consumers are manifesting some interest in the matter. Asking prices remain as follows: \$19.50 @ \$20 for Bessemer, c.i.f. duty paid.

Blooms.—A fair average business is doing, but without change in prices, which are about as follows: Nail Slabs, \$28.50 @ \$29.50; Billets from \$30 to \$35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite \$42 @ \$44; Scrap Blooms, \$33 @ \$35 per "bloom" ton of 2464 lb. Foreign at tide, c.i.f., duty paid, \$29 @ \$30 for Nail Slabs; \$31.50 @ \$32.50 for 4 x 4 Billets, and \$35 @ \$39 for Siemens-Martin, price according to analysis, &c.

Muck Bars.—The market has been very active, with sales at prices ranging all the way from \$27.50 to \$28, delivered. Mills are now nearly all sold close up, and quotations are said to be from \$28.50 to \$29, delivered, although it remains to be seen what buyers will do in the matter. Bids of \$28 have been declined, however, and the position seems to be very strong.

Bar Iron.—The demand has been increasing for some time, until at last prices are beginning to respond to the improved condition of affairs. There is still a great

lack of uniformity in quotations, but they average an advance of pretty nearly a tenth, compared with those made two or three weeks ago, and from present appearances the improvement is likely to be maintained. There is nothing spasmodic in the demand, nothing specially large in any particular line, but from all sources orders come in a steady flow, indicating a generally satisfactory consumption in all departments. It is not unlikely, however, that the demand for Skelp Iron has been of considerable advantage to some of the local mills, most of which are now pretty well filled up for several weeks to come. A very similar condition of affairs is also said to prevail in the interior, so that new business is not run after as it was some time ago. For the same reason buyers find that prices are higher, and, while no large orders have been taken at any material advance, sellers are not disposed to accept business without securing some concessions in their favor. On the whole, the impression is that prices have touched bottom, and with favorable developments during the next two weeks it is not improbable that still further advances may be demanded. As already stated, quotations are very irregular, but most of the leading mills quote 1.85¢ @ 1.9¢ for Best Refined Bars, and are said to be very firm. Others, however, whose make of Iron is not as well known, might perhaps shade a fraction, but the general tone is one of strength and firmness. Large sales of Skelp Iron have been made at 1.8¢ @ 1.82½¢ for grooved, and 1.9 @ 2¢ for sheared, but higher figures are asked on new business.

Plate and Tank Iron.—The demand is improving and sellers are showing more firmness than they have for several weeks past. No specially large orders are on the market, but there is a good general demand and the outlook is said to indicate a still larger business as the season advances. Mills are not heavily loaded with work, but they seem to have all they can handle from week to week, and with still better prospects ahead there is a disposition to ask a little more money, or on specially desirable orders to hold firm at last week's prices, which are about as follow: Ordinary Plate and Tank Iron, 2¢ @ 2.10¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.3¢ @ 2.4¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 4¼¢.

Structural Iron.—A somewhat better demand is reported for small lots, but there is nothing of importance in the market. Mills are moderately busy on specifications to complete old contracts, and it is said that prospects for new work are fairly encouraging, but there is nothing very definite at present. Prices firm as last quoted, viz.: 2.10 @ 2.15¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron.—The demand is very irregular. Some mills appear to have plenty of work, while others report quite the reverse. Prices show similar irregularity, but for small lots, of best makes, quotations are about as follows:

Best Refined, Nos. 26, 27 and 28.....	3¼¢ @ 3½¢
Best Refined, Nos. 18 to 25.....	3¢ @ 3¼¢
Common, ½¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28.....	4¼¢ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25.....	4¢ @ 4¼¢
Best Bloom Sheets, Nos. 16 to 21.....	3½¢ @ 3¾¢
True Annealed.....	2.8¢ @ 3¢
Best Bloom, Galvanized, discount.....	62½%
Common, discount.....	67½%

Merchant Steel.—The demand has fallen off somewhat since our last report, although the mills are well supplied with orders. Inquiries are numerous, more especially for the finer grades of Steel. Prices are firm at last week's quotations, viz.: Tool Steel, 8½¢; Machinery, 2.6¢; Crucible Spring, 4½¢; Open-Hearth

Ordinary Spring, 2.7¢ @ 2.9¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Steel Rails.—A better feeling is reported in this department, and it is thought that prices are held with more confidence. Sales have been chiefly in small lots at \$29 @ \$29.50, at mill, and \$29 is said to be an inside figure for the very best class of orders. There is more inquiry than usual, and the outlook generally is considered to indicate an early improvement.

Old Rails.—It is hardly worth quoting this market, as there are no Rails for sale, although it is likely that \$21.50 @ \$22 would be paid for T's, spot or to arrive. But there are none for sale at anything near these figures, so that buyers will probably fill their requirements elsewhere.

Scrap Iron.—Increasing firmness may be noted, with prices about as follows: \$19.50 @ \$20.50 for cargo lots; \$20.50 @ \$21 for carload lots, delivered or for choice \$21.50 @ \$22; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel tails, \$19 @ \$20; Cast Scrap, \$14 @ \$15 do. Borings, \$9 @ \$10; Old Fish Pies, \$24 @ \$25. Old Car-Wheels, \$17 @ \$18, Philadelphia, or its equivalent.

Wrought-Iron Pipe.—Mills report a full complement of order, and are likely to be well employed up to the close of the year. Prices continue droopy, however, and it is difficult to quote with any degree of accuracy. Discounts are quoted as follows: Black But-Welded, 55%; on Galvanized do., 45%; on Black Lap-Welded, 65%; on Galvanized do., 52½%; on Boiler Tubes, 60%.

Nails.—A very general improvement is noticeable in this department. Mills are all busy and their product is being marketed without ruinous cutting of price, which has been the custom for some months past. Orders for future delivery at present price are being refused, and with light stocks and increasing demand, manufacturers have some ground to expect an advance in price. At the moment lots from store are quoted at \$2, with the usual discount on carload lots.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St.,
CHICAGO, September 3, 1888.

Pig Iron.—The majority of furnace agents and dealers report a quiet week, but a few are still enjoying a good trade. The latter class comprise those who have some brands of Iron to dispose of at current prices. They are being sought for by consumers who were disinclined to believe the reports they heard about the increased demand for Pig Iron and the hardening of prices. Some large buyers are included among the number, and their purchases have caused more furnace companies than were previously reported to retire from this market, having sold all the Iron they cared to place at present prices. Makers are undoubtedly attempting, though not through any concerted arrangement, to advance their rates, but the success of their efforts will depend on contingencies, prominent among which is the revival of the demand for all classes of material from the railroad companies. About Southern Coke and Lake Superior Coke Irons, however, there is no doubt, as prices have already been marked up. We quote for cash as follows: Lake Superior Charcoal, all numbers, \$19.50 @ \$20; Alabama Car-Wheel, \$26.25; Southern Charcoal Foundry, No. 2, \$18.50 @ \$20; Jackson County Softeners, No. 1, \$18.25 @ \$18.75; Hocking Valley, Soft Foundry, No. 1, \$17 @ \$18; American Scotch (Blackband) No. 1, \$18.50 @ \$19.50; other Ohio Scotch Irons, No. 1, \$17.50 @ \$18; Lake Superior Coke, No. 1, \$17.50 @ \$18.50; No. 2, \$16.50 @ \$17.50;

No. 3, \$15.50 @ \$16.50; Southern Coke, No. 2, \$17.75 @ \$18; No. 2½ and Open Bright, \$17 @ \$17.50; No. 3, \$16.50 @ \$17.

Bar Iron.—An undoubted improvement in the general demand leads to the presumption that the commencement of fall business has set in. Manufacturers' agents report numerous inquiries from miscellaneous consumers, and sales have been made at 1.70¢ @ 1.72½¢, f.o.b. Chicago, half extras, for Common Iron. The demand is largely local at present, but the upward tendency in prices will probably soon enlarge the circle of purchasers. Contracts for cars have been placed to some extent, and the consumption of Bar Iron is expected to show a decided increase in that direction very shortly. The quotations now being made by the mills are for immediate acceptance, everything in the nature of options having been withdrawn. Sales agents complain of the uncertainty which this condition of affairs imposes on them, as they are equally solicitous of protecting their customers and pleasing their principals. Jobbers quote 1.80¢ @ 2¢, from store, according to quantity and quality.

Structural Iron.—A good week's business has been done in bridge work. The heaviest single contract in this line was taken by the Chicago Forge and Bolt Company, who bid \$40,950 for the Fifth avenue approach to the Twelfth street viaduct in this city. Competing bids ranged from \$43,900 to \$48,789. The demand for Beams is declining with the approaching close of the building season. Prices are very firm at previous quotations, carloads of Angles from mill being held at 2.20¢, f.o.b. Chicago; Universal Plates, 2.30¢; Tees, 2.45¢; Beams and Channels, 3.40¢. Store prices are as follows: Angles, 2.40¢ @ 2.50¢; Tees, 2.60¢ @ 2.70¢; Beams, 3.80¢.

Plates, Tubes, &c.—Few mill orders have appeared in the market recently, but the jobbing trade has been very satisfactory. The territory covered by the Chicago dealers is growing again, restrictive influences, which were temporarily exerted, having disappeared. No changes in prices are reported, but the whole list is firm. Store prices are as follows: Heavy Sheets, Nos. 10 to 14, 2.65¢; Tank Iron, 2.55¢; Tank Steel, 2.80¢; Shell Iron, 3¢; Shell Steel, 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 60 % and 65 % off on 2½-inch and larger, according to specifications, and 62½ % off on 2-inch and smaller.

Sheet Iron.—Good-sized orders are still to be picked up in this market by mills able to handle them, but great difficulty is experienced in finding the mills willing to contract for deliveries earlier than November or December. Jobbers have again advanced their prices and now quote small lots of No. 24 at 3.30¢, Nos. 25 and 26 at 3.20¢ and No. 27 at 3.30¢, with a slight concession to best buyers.

Galvanized Iron.—Although manufacturers' agents report a sufficiently active demand to keep their stocks very low, and the mills are unable to increase their shipments in this direction because of a similarly strong demand from other districts, yet the price does not improve. It is expected that an upward movement will take place before long, however, if values of other Iron and Steel products continue to appreciate. Quotations are as follows for small lots: Juniata, 60 and 10 % off; Charcoal, 60, 10 and 5 % off.

Merchant Steel.—Nothing of special interest has occurred in this branch of trade. Stores report an excellent movement in small lots. They quote as follows: Bessemer Bars, 2.30¢ @ 2.40¢;

Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.40¢; Open-Hearth Spring, 2.90¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 10¢.

Steel Rails.—Increased inquiry is reported, and a few sales of 500 to 2000 tons each have been made. The high price of Old Iron Rails has already induced some railroad companies, which have been practicing rigid economy this summer, to take up a considerable length of old track and relay it with new Steel Rails while they can be had at such low prices as are now ruling. The mills could probably sell many more Rails if they were not so manifestly eager for business. Their weakness inclines the railroad companies to defer purchasing until they are absolutely sure that the bottom has been touched. It is possible that they may hesitate too long, in view of the upward movement in prices of other Iron and Steel products. Quotations now range from \$30 to \$31, according to quantity.

Old Rails and Wheels.—The available supply of Old Iron Rails is quite limited. Although railroad companies are now taking up Old Rails quite freely, on account of their advance in price, a spirit of speculation has developed, and considerable quantities are being withdrawn from the market to be disposed of when higher figures are reached. It is reported that \$25.25 was refused by a dealer who expects to sell at \$26. Sales of several thousand tons were made earlier in the week between \$23 and \$24. Consumers insist that they will not pay more than this, but they so expressed themselves when Old Rails had advanced to \$20. Sales of Old Car-Wheels are reported at \$19, but they are not to be had in quantity at that price.

Scrap.—Consumers are looking about more freely for Forge Scrap, which is not in excessive supply, and they find dealers indisposed to sell more than moderate quantities, for which they ask higher prices. Some name \$20 for strictly No. 1 Railroad Shop, reporting actual sales at \$19.50, net ton. The demand for Mill Iron is fair. Cast and Steel Scrap are both quiet. Fish Plates are higher, in sympathy with Old Rails, sales having been made at \$20 @ \$20.50, net ton. Dealers offer \$13 @ \$14 for Mixed Country Scrap. Selling quotations for carefully selected are as follows, 1 ton of 2000 lb: No. 1 Forge or Railroad Shop, \$19 @ \$19.50; Track, \$18.50; No. 1 Mill, \$15 @ \$15.50; Light Wrought, \$11; Horseshoes, \$18; Axles, \$25; Cast Machinery, \$13.50 @ \$14; Stove Plate, \$11; Cast Borings, \$9; Wrought Turnings, \$11; Axle Turnings, \$13; Coil and Leaf Steel, \$16; Locomotive Tires, \$16.50.

Hardware.—The demand is good for both Shelf and Heavy Hardware, some houses reporting a steady improvement from week to week. Seasonable goods have moved off satisfactorily, including Tinners' stock, Stove Boards, Coal Hods and Stove Furniture generally. Carriage Bolts have been advanced ¼¢. Shot has also been marked up 10¢ per sack, \$1.40 now being asked from store.

Nails.—The advance in Cut Nails made by the Western Nail Association was immediately put in force in this market, agents asking \$2.02½, f.o.b. Chicago, for factory lots of Steel Nails. Both manufacturers' agents and jobbers had been enjoying an improved demand and the market was in good shape for an advance. A falling off in business was the immediate result, but this will probably only be temporary. As soon as it is apparent that the advance will be maintained buying will be resumed. Nails are now sold from store at \$2.10 for Steel and \$2.60 for Wire, which ought to be the price for carloads, with the present cost of factory lots.

Barb Wire.—A little movement is being felt by manufacturers and jobbers, but no large sales are reported. Nevertheless, a heavy fall trade is expected. Last year a good summer demand was experienced and no fall business. This year the conditions seem to be reversed. Prices are thoroughly demoralized. Painted is being sold at low as 2.90¢ from stock. This was brought about by the action of certain manufacturers, who cut Galvanized from the usual difference of 75¢ @ 100 lb to 65¢. It immediately affected the price of Painted to the same extent.

Pig Lead.—Speculative buying has been the feature of the market here and in St. Louis the past week. One buyer is said to have absorbed nearly all the offerings, amounting to 2500 tons at both points. Prices at Chicago varied from 4½¢ early in the week to 4.60¢ @ 4.65¢ at the close.

Pittsburgh.

Office of The Iron Age, 77 Fourth Ave., Pittsburgh, September 4, 1888.

The Iron and Steel industries in this district continue to improve; the volume of business is steadily increasing. Nearly all the mills are in operation, some of them working up to their full capacity, but the great trouble is to get up the prices of the products sufficiently to correspond with the greatly enhanced cost of production. Pig Iron has gone up \$2 @ \$3 per ton; Old Rails, \$3 @ \$4; Muck Bar, \$2.50 @ \$3, while Finished Iron as yet has not been advanced more than \$1 @ \$1.50 per ton. However, it is being advanced almost every day, and as long as the former continue to go up the latter will follow. In regard to the present boom the trade generally regard it as being regular and legitimate. Thus far there has been in this district an absence of speculation. There was some Pig Iron bought on speculation when the upward turn was first inaugurated early in July, but at present business in all branches of Iron and Steel is legitimate and is being conducted upon the law of supply and demand. Thus far there has been little or no improvement in the market for Steel Rails, and this is regarded as about the only weak spot apparent at present in connection with the present improvement.

Pig Iron.—The market is strong and considerably excited, and, since our last report, there has been a further advance of 50¢ to 75¢ per ton. Brokers report continued difficulty in finding sellers, as nearly all the furnaces in blast are sold from one to three months ahead; some of them have contracts that will absorb their entire product during the remainder of the present year, and they are feeling a little sore in regard thereto, as they could have done a good deal better by holding off, but they obtained full market price at the time. As compared with the lowest point, there has been an advance of \$2.20 to \$2.25 per ton on Mill Irons, and, while some well-posted operators are inclined to the belief that the zenith has been reached, others whose views are equally good look for still higher prices. There has been a decided improvement in the demand for Foundry Irons during the week under review, and it has been demonstrated that a good many foundrymen were caught napping. We quote prices as follows:

Neutral Gray Forge.....	\$15.75 @ \$16.50,	cash
All Ore Mill.....	16.75 @ 17.00,	"
No. 1 Foundry.....	17.00 @ 17.50,	"
No. 2 Foundry.....	16.25 @ 16.50,	"
No. 4 Foundry.....	15.50 @ 16.00,	"
No. 1 Charcoal Foundry.....	23.00 @ 24.00,	"
No. 2 Charcoal Foundry.....	21.00 @ 22.00,	"
Cold Blast Charcoal.....	25.00 @ 27.00,	"
Bessemer Iron.....	17.75 @ 18.50,	"

There were sales of Bessemer at \$18, cash, here and one lot reported at \$19, cash, delivered at East St. Louis. Sales

No. 1 All Ore Foundry Iron at \$17.50, cash, and All-Ore Mill at \$16.75 @ \$17, four months.

Muck Bar.—There is an active demand for Muck, with but little offering. As compared with the prices of a week ago, there has been a further advance of 50¢ per ton. So far as we have been advised there have been no sales above \$29, cash, but a further rise of 50¢ to \$1 per ton within the next week or so is expected.

Manufactured Iron.—The continued advance in Pig Iron is carrying Finished Iron up with it, and in the present condition of the market, with the raw article worth considerably more than the products, manufacturers are not disposed to make large contracts, especially for future delivery. Jobbers and large consumers, on the other hand, are anxious to anticipate future wants for the same reason that manufacturers are holding back, being apprehensive of higher prices. It is safe to say that there has been an advance of from \$1 to \$1.50 per ton on all kinds of finished iron, and the indications are that prices will go higher, as they are still too low as compared with the cost of the raw material. Those mills using Old Rails fare still worse, as they have advanced considerably more than Pig Iron.

Nails.—There has been little or no improvement in the Nail trade as yet, and the outlook is not very encouraging. While we continue to quote card rates, and Pittsburgh makers are refusing to "cut" below, buyers, it is stated, are able to do better elsewhere. How it is that they can be sold below card rates, in view of a recent advance of \$1 per ton in the price of Nail Slabs, is one of those things that is hard to find out. Manufacturers here say they will let their factories stand idle before they will sell Nails at or below cost of production.

Wrought-Iron Pipe.—While there is not much of an improvement in the demand for Pipe, some of the mills are reported reasonably well employed, and the prices are firmer, owing largely to the enhanced cost of Pipe Iron. However, it is difficult to give reliable quotations, as each firm is still making its own rates, independently of each other. However, discounts have been reduced somewhat and are likely to go still lower, and this is causing an increased demand. General discounts on large lots appear to be 5 1/4% on Black Butt-Welded, and 50% on Galvanized; 6 1/4% on Black Lap-Welded, and 60% on Galvanized; Boiler Tubes, 65%; 4 casing, 35¢ per foot net; 2-inch Oil-Well Tubing, 12 1/2¢ net.

Old Rails.—The market continues strong, and with an active demand and very few to be had, prices have further advanced. We now quote at \$24 @ \$25 for American, an advance of \$1 to \$1.50 per ton. No sales reported. It is intimated that \$25 could probably be obtained for immediate delivery. At prices quoted foreign might be put here from the seaboard, but an advance there is probable, as it is claimed that they cannot be imported at present prices. In this market there has been an advance of \$3 to \$3.50 per ton within the past 60 days, and a good many consumers were caught napping—had no stock whatever.

Steel Rails.—There has been no improvement in the demand for Rails here, and \$30, cash, is still given as the nominal price, delivered at works. As Bessemer Iron has advanced \$10 per ton within a few weeks, it is evident that there is not much margin in Rails at present prices. It is possible that there will be an improvement before the close of the year.

Billets, &c.—Sales of Bessemer Steel Billets are reported at \$29, cash, on cars at makers' works, and the same quotation is made for Nail Slabs. Domestic Rail

and Bloom Ends quoted at \$18.50 @ \$19. Sale foreign Crop Ends at \$23.25, delivered in Pittsburgh.

Merchant Steel.—There is an improved demand, but no improvement as yet in prices. Best brands Tool Steel, 8 1/4¢; Crucible Spring Steel, 4 1/4¢; Crucible Machinery, 5¢; Open Hearth, 2 1/4¢.

Railway Track Supplies.—Spikes are firmer. Splice Bars may now be quoted at \$1.85 @ \$1.90. Track Bolts unchanged at \$2.85 with Square and \$2.95 with Hexagon Nuts.

Old Material.—Of all kinds is in demand, firmer and higher, with but little offering. No. 1 Wrought Scrap, \$20 @ \$21 per net ton; Wrought Turnings, \$13.50 @ \$14; Car Axles, \$24 @ \$25; Cast Scrap, \$15.50 @ \$16, gross; Cast Borings, \$12 @ \$12.50; Old Car-Wheels, \$20, gross.

Detroit.

WILLIAM F. JARVIS & Co., under date of September 3, report as follows: The past week has shown an active market and the inquiries received certainly indicate that a general buying movement has set in, and this, taken in connection with the action of some of the Mahoning Valley furnaces, advancing prices from 50¢ to \$1 per ton, and not anxious for orders, even at the advance, shows that a decided advance is likely to take place at any time. Lake Superior Charcoal has taken the lead, and sales aggregating several thousand tons have been made. Some good sized orders for Southern Mill Iron have also been placed in this market. Old Car-Wheels are very hard to obtain, although some sales have been made at an advance of \$1.50 per ton over prices of a month ago. We report the market active and very firm and quote as follows:

Lake Superior Charcoal, all numbers.....	\$20.00 @ \$20.50
Lake Superior Coke, all ore.....	19.75 @ 20.25
Lake Superior Coke, cinder mixed.....	18.50 @ 19.00
Standard Ohio Black Band.....	19.75 @ 20.25
Southern No. 2.....	17.75 @ 18.25
Southern Gray Forge.....	16.25 @ 16.75
Southern Silvery.....	17.00 @ 17.50
Jackson County (Ohio) Silvery.....	18.50 @ 19.00
Old Wheels.....	20.00 @ 20.50

Cleveland.

CLEVELAND, September 3, 1888.

Iron Ore.—Nearly all varieties of Bessemer Ores have advanced from 25¢ to 50¢ per ton. A round lot of No. 1 Specular and Magnetic Bessemer Ore sold during the week for \$6.25 per ton, f.o.b. cars Cleveland, and high-grade Menominee Bessemer bring readily from \$5.10 to \$5.25 per ton. Gogebic Bessemer are so closely sold up that quotations are of little value, although a few scattering sales at \$5.15 @ \$5.30 are reported. Lake freights go bounding along upward, the Ashland rate having crept up from \$1.15 to \$1.60, the Marquette rate from \$1.05 to \$1.40, and the Escanaba rate from 85¢ to \$1.20. Because of this increased cost of transportation a few important negotiations remain unclosed. Buyers hesitate before paying the advance believed by the mine owners to have been made necessary by the heavier lake freights. This fact, together with the closely-sold-up condition of the market, especially in the matter of Bessemer Ores, has kept the volume of business below that of any former week for two months or more. The market, however, is far from dull. Enough Ore is changing hands, even at the advanced quotations, to insure a most thorough clearing up of the output. Quotations f.o.b. cars, lower lake ports, are as follows:

No. 1 Specular and Magnetic Bessemer Ore.....	\$5.75 @ \$6.25
No. 1 Specular and Magnetic Non-Bessemer Ore.....	5.00 @ 5.25
Red Hematite Bessemer Ore.....	5.00 @ 5.25

Red Hematite Non-Bessemer Ore....	4.00 @ 4.25
Menominee Range Bessemer Ore....	5.00 @ 5.25
Menominee Range Non-Bessemer Ore.....	4.00 @ 4.25
Gogebic Range Bessemer Ore.....	5.00 @ 5.25

Pig Iron.—A majority of the furnaces report sales from 60 to 90 days ahead of production. This heavy demand upon the furnacemen, and the anticipated scarcity, has had the effect of advancing quotations. Lake Superior Charcoal Irons are to-day quoted at \$20.50 @ \$21.50; No. 1 Strong Foundry, Bessemer Iron, \$18 @ \$18.50; No. 2 Strong Foundry, \$16.70 @ \$17.30; No. 1 American Scotch, \$18.25 @ \$18.70; No. 2 American Scotch, \$17.20 @ \$17.70; No. 1 Soft Silvery, \$17.50 @ \$18.50; Mahoning and Shenango Valley Neutral Mill Iron, \$15.50; Mahoning and Shenango Valley Red Short Mill Iron, \$16.

Scrap Iron.—A sale of 600 tons of No. 1 Wrought Scrap has occurred. Old American Rails are selling at \$22.25 and are in fair demand. The Board of City Improvements this morning sold the 70 tons of Old Iron from the Seneca street bridge to Swatzenberg Bros. for \$18 per ton.

Louisville.

LOUISVILLE, KY., September 3, 1888.

Pig Iron.—The demand for Iron continues steady and holders are firm. Buyers, however, are hardly willing to pay the prices asked by some of the furnaces and are yet able to supply their wants at prices current during the last week. It is evident that if the Eastern market would advance in sympathy prices would improve at least 50¢ to 75¢. To advance, however, the West will have to carry the Ohio market, which has large quantities of Iron for sale, some furnaces having stacked large blocks of Iron during the last few months, preferring to hold rather than to sell. Advances from this district to-day show that they have felt the improved market and sales have been effected at increased prices over those current during the last ten days. Large blocks of Southern Iron have not been sold, as furnaces have not the Iron to spare, many of them having taken very large orders at prices current two months ago, and are not now in position to realize on the present market. Conservative furnacemen, who were not disposed to sell for a year's delivery, as was done in many instances, now are in excellent position to reap their reward. Old Rails have advanced strongly, and are now held at \$23 with offers of \$22.75. Old Wheels are in active demand at \$20.

Southern Coke, No. 1 Foundry....	\$17.00 @ \$18.00
" " No. 2 ".....	16.00 @ 16.50
" " No. 2 1/2 ".....	15.50 @ 16.00
Hanging Rock Coke, No. 1 Foundry.....	17.25 @ 17.75
Hanging Rock Charcoal, No. 1 Foundry.....	21.00 @ 23.25
Southern Charcoal, No. 1 Foundry.....	18.00 @ 18.50
Silver Gray, different grades.....	14.50 @ 15.25
Southern Coke, No. 1 Mill, Neutral.....	14.25 @ 14.75
" " No. 2 ".....	13.75 @ 14.25
" " No. 1 " Cold Short.....	13.75 @ 14.25
" " Charcoal, No. 1 Mill.....	14.50 @ 15.75
White and Mottled, different grades.....	13.00 @ 13.50
Southern Car-Wheel, standard brands.....	23.25 @ 25.25
Southern Car-Wheel, other brands.....	19.25 @ 21.25
Hanging Rock, Cold Blast.....	23.25 @ 25.25
Hanging Rock, Warm Blast.....	19.25 @ 20.25

Chattanooga.

Office of The Iron Age, Carter and 9th Sts., CHATTANOOGA, September 3, 1888.

Pig Iron.—There can be no doubt that the prices of Pig Iron are steadily on the advance. One of the best evidences of this is the fact that parties who are not consumers are getting contracts of different furnaces for round lots of 250 to 500 tons, in some cases even larger, to be delivered when called for, in monthly installments, through the balance of the year. In some cases the money is paid down at the time of the contract, while other lots are to be

paid for as delivered, and nearly all are sold f.o.b. without commissions. There is hardly a producer in the South who is not on the alert and expecting better prices to rule during the balance of the year, and, having this in view, is very cautious about selling largely for future delivery. Nos. 2 and 3 Foundry appear to be the favorite grade that is being handled in this way and the result is that the selling agents of the different furnaces are frequently without stocks to offer consumers. Should this condition of things continue any length of time it requires but little foresight to see that prices will advance considerably during the balance of the year. There are absolutely no stocks of desirable grades in the yards of any of the furnaces, and the indifference of producers to sell even at present advanced prices must certainly act as a further incentive to stiffen prices.

Cincinnati.

CINCINNATI, September 3, 1888.

Pig Iron.—The local market for Pig Iron has continued active during the past week and a strong tone has prevailed, with higher prices realized. The aggregate sales for the past week were about 30,000 tons, including orders for Mill and Foundry grades, Southern and Northern makes, off qualities, as well as standard brands. But, while the business has been of varied character and transactions "scattered," a very large proportion of the trade has been in Forge Iron of some description. And, while the majority of sales have been of Southern production, there have been increased sales of Southern Ohio, Pennsylvania and Lake Superior Iron. A feature upon which dealers lay particular stress is that special brands will now command a considerable advance over the general market, although the level has been considerably advanced during the past few weeks. The fact, also, that Softeners, Mottled, and off grades sell so much more readily, and at full prices, is cited as of particular encouragement. No. 2 Southern Foundry Iron has been sold at \$16 @ \$16.50, mainly at \$16.25; No. 1 Mill, at \$15 @ \$15.25, and No. 2, do., at \$14.50 @ \$14.75; Mottled Iron at \$13.50 @ \$13.75. There has been less movement in Car-Wheel Iron, but a fair inquiry. Individual sales have been of larger amounts, a number of 1000-ton orders having been placed and some of greater magnitude, and the prospect is favorable for the fulfillment of negotiations now in progress of several 5000-ton lots. The following are the approximate quotations for the local market, cash, f.o.b. Cincinnati:

Hot-Blast Foundry.

Southern Coke, No. 1.....	\$17.50 @ \$18.50
Southern Coke, No. 2.....	16.50 @ 17.50
Southern Coke, No. 3.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 1.....	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2.....	15.50 @ 16.00
Mahoning and Shenango Valley ..	17.50 @ 18.50
Hanging Rock Charcoal, No. 1.....	20.50 @ 22.50
Hanging Rock Charcoal, No. 2.....	19.50 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.50 @ 19.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.

Strong Neutral Coke.....	14.75 @ 15.00
Mottled Neutral Coke.....	13.50 @ 13.75
No. 1. Mill Coke.....	15.00 @ 15.25
No. 2 Mill Coke.....	14.50 @ 14.75

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 21.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.50 @ 21.50

Manufactured Iron.—The market has gathered more strength, with more encouraging orders for all kinds. Common Bar Iron, 1.90¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ @ 1b.

Nails.—There has been a quiet and easy market under free offerings without

essential change in prices. Jobbing prices are based upon 12d @ 40d, which sell at \$2 ¾ keg, with 10¢ rebate in carload lots, at mills. Steel Nails sell at \$2 and Steel Wire Nails at \$2.65 @ \$2.75 ¾ keg.

Old Material.—A strong and buoyant tone has prevailed with a further material advance in prices. The demand for Old Rails is especially urgent, with buyers at the close at \$23, while holders ask \$24. The demand for Old Wheels has been fair, and under a light supply prices have advanced to about \$21, but there has been no trade to establish the exact market.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, September 5, 1888.

American Pig.—What improvement there has been in this market during the past month may be summarized in the statement that cutting has ceased almost entirely. Occasionally reports come of prices being made slightly under the market; thus a round lot of Southern No. 2 Foundry has been sold at Sing Sing at \$16.75. Representatives of Ohio furnaces report that their principals are doing better in their own territory than the figures which can be realized in this State, and the Southern furnaces, too, are getting relatively better prices in the West. Production in the South will show an increasing tendency. Among the new furnaces just completed, which are to blow in during the current month, is one of the Sloss at North Birmingham; a second De Bardeleben, at Bessemer; the Gadsden, and one or more at Sheffield. There are a fair number of inquiries in the market and a moderate amount of business is being done, with some scarcity of No. 1 being reported. We quote for standard brands of Northern Irons, \$18 @ \$18.50 for No. 1 Foundry; \$16.75 @ \$17.50 for No. 2 Foundry, and \$15.75 @ 16.25 for Gray Forge.

Scotch Pig.—The market is very dull, prices being relatively too high, compared with American Iron, to allow of the use of Scotch Pig, except where founders still conservatively retain the belief that they cannot get along without it. We quote, nominally, Coltness, \$20 @ \$20.25; Langloan, \$19.25 @ \$19.50, and Dalmellington, \$19 @ \$19.25.

Ferromanganese.—Foreign has risen above the price at which Domestic can be bought at points in the Pittsburgh district and west of that point. We quote Foreign 80 %, \$50.50 @ \$51.

Bar Iron.—The advance of Mill Iron and Muck Bar in the West, and of Old Material, is likely to soon tell on both Refined and Common Iron, and the market is showing a firmer feeling now. We quote for carload lots, half extras, on dock, 1.57½¢ @ 1.65¢ for Common; 1.65¢ @ 1.7¢ for Medium, and 1.75¢ @ 1.9¢ for Refined.

Structural Iron.—There is a better feeling, although the volume of business in this section has not increased materially. The only large order on the market is the Springfield Bridge, calling for 1500 tons of Structural Material, which is to be let to-day. We quote for round lots, on dock: Sheared Plates, 2¢ @ 2.10¢; Universal Mill Plates, 2.10¢ @ 2.15¢; Angles, 2.1¢ @ 2.15¢; Tees, 2.5¢ @ 2.7¢ and Channels and Beams, 3.3¢.

Plates.—We quote for round lots, on dock: Iron Tank, 1.9¢ @ 2¢; Shell, 2.15¢ @ 2.30¢; Steel Tank, 2.25¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.7¢ @ 3¢, and Fire-Box, 3.7¢ @ 4¢. Galvanized Sheets are 65 % @ 65 and 5 %.

Steel Rails.—The market continues dull, though some of the sellers express less anxiety concerning deliveries for the winter months. They claim that their

works are fairly busy in other directions, and that relatively they are getting better prices for Slabs, Billets, &c. While this may be true of some of the Eastern mills, the representatives of the leading Western works indicate that they have very little business in sight. While usually a considerable percentage of the orders finally booked are not counted upon long ahead, still there is a dearth of work in the Northwest, the only order talked of being for a road affiliated with the Northern Pacific, for 14,000 to 16,000. A good deal of financing of securities will have to be done before many Rails can be sold. The matter is one which deeply interests the entire Iron trade. Thus far raw material has advanced independently of the Rail trade, but it may well be questioned whether this movement can progress much further until a heavier demand for Rails sets in. Rail-makers generally confess that they see no hope for a rise in the market before a good deal of winter work has been placed and of that they see no signs as yet. How far behind this year's demand has been as compared with last is shown by the fact that up to August 1, 1887, the deliveries for the year were 1,045,048 gross tons. To the same date this year they were 710,502 gross tons. We continue to quote \$28.50 @ \$29 at Eastern mill for standard sections.

Blooms and Billets.—No business in foreign material is reported, prices being relatively too high.

Wire Rods.—Only small lots are being called for. We quote \$39.50 @ \$40.

Old Rails.—The only sales during the week have been 800 tons Bridge Rails and 200 tons foreign Tees at private terms. The market is very strong, with several large orders unfilled. The supply is limited here. It is estimated that the stock here is from 8000 to 10,000 tons, of which about 3500 tons are Double Heads. For a lot of the latter, ex-store, \$24, cash, has been declined, and nothing under \$25 is entertained, and then they are not offered firm at that price. Tees, in store here, are held at \$24, though it is believed that \$23.50 might be entertained. Private cables report the c.i.f. price of Doubles at 72/6, which is equivalent to \$24.50, without any margin to importer. The price quoted for shipment is \$25 for Doubles and \$24 for Tees. The market is excited, but business is restricted by the absence of stock. The holdings here are practically in the hands of four parties, among which is a banking house, while one lot of about 2600 tons is held by a Philadelphia firm, and one round lot is held on European account. We quote \$23.50 @ \$24 for Tees and \$25 for Double Heads.

Track Material.—The advance in Old Rails has caused a stiffening in Spikes. Offers are being withdrawn, and agents have instructions not to sell anything above very small lots, which are quoted \$2.15, before submitting orders to their principals. In Angle Bars a firmer tone also prevails.

The Pottsville Iron and Steel Company, of Pottsville, Pa., have appointed Charles C. Loring, No. 4 Liberty Square, Boston, Mass., their agent, in place of A. G. Tompkins, for the sale of their Beams, Channels, Angles, Tees and Plates in the Eastern States.

Metal Market.

Copper.—In London the speculators have run up during the week spot Chili bars all the way to £95, while futures improved to £79. 5/ and are now £79. Good merchantable brands have advanced to £76. 10/, and Best Selected has risen to £80. As the visible supply in England and

France on the 1st inst. has increased to 84,140 tons, against 75,474 on August 1, a difference of 8,666 tons, this is about as bad a show as can be made, hence the above advance to £95 can only be the result of manipulation foreign to the real position of the metal, and this explains the apathy here in the face of the said rise. Our market has been pretty much stagnant, and is quoted this morning 16.10¢ for spot and September nominally. A dispatch was received here by one of the daily papers from Boston to the effect that the syndicate was taking steps to extend its contracts with mining companies on this side from three years to 12, upon condition of the companies reducing their present output 20 %, so as to prevent accumulation of stock, inevitable in view of the steady falling off in consumption. The Anaconda will be open for a new contract, to date from January 1 next, and this piece of news may have been started as a feeler. Or perhaps it is a mere Boston Copper stock-jobbing "canard" to influence the market for stocks favorably. Rio Tinto shares rose 20 francs in Paris last week.

Tin.—London suddenly rose last week £5. 10/ per ton with spot Tin, and £6. 5/ with futures, the outstanding short interest to be covered being supposed to be so large as to favor this unexpected improvement—unexpected, because there was an impression that the statistics, in consequence of heavy Eastern shipments, would prove anything but encouraging. These statistics are, indeed, not of a stimulating nature, the visible supply on September 1 in Europe and America being 12,740 tons, against 13,966 on August 1, a decrease of only 1226 tons. Last year on September 1 it was 11,573 tons, and 11,690 on September 1, 1886. London came £97. 7/6, spot, yesterday, but is again £98. 2/6 to-day, while futures rose from £97. 17/6 to £98. 12/6. Here, last week some 40 tons were taken at 21.10¢ @ 21.90¢, and this week 20 tons September at 21.90¢ @ 22¢, 75 tons October selling to-day at 22.15¢, 22.20¢ and 22¢, the latter the last transaction, the market winding up quiet at 22.15¢, spot. As per cable message from Gilfillan, Wood & Co., Singapore, to Mr. Charles Nordhaus, New York, September 1, the August shipments this way were 300 tons, against 750 last year; to England, 1800, against 1300; since January, respectively, 1450, against 3550, and 12,400, against 8800. **Tin Plates.**—The scarcity of Coke Tins continues, and under a good demand the quotation, as shown at foot, is slightly higher. Other descriptions also move off to a fair extent on the spot; futures sell with ease at figures somewhat below spot prices. Liverpool, meanwhile, exhibits great strength. We quote toward the close, large lines, per box, on the spot: Siemens-Martin Steel, charcoal finish, \$4.85 @ \$5.25; Coke finish, \$4.75; Ternes, \$4.30 @ \$4.40; Bessemer Cokes, \$4.60 @ \$4.65, and Wasters \$4.20 @ \$4.25; Liverpool is 13/6 with Coke Tin.

Lead.—During the week some 2000 tons have again been taken by speculators in the open market and on the Exchange, taken together, at up to 4.95¢. Consumers have bought absolutely nothing, and they at their late meeting have not even advanced prices, nor have White-Lead manufacturers, the demand for all these Lead manufactures being too slack to warrant higher prices, and thereby perhaps interfere with the expected fall demand still to come. At St. Louis 500 tons were purchased for New York at 10¢ above the price it can be laid down here with 20¢ freight, the quotation there being 4.65¢. At the close 4.92½¢ has been bid and 5¢ asked, 100 tons November having sold to-day at 4.85¢. The entire speculation seems unreasonable and is looked upon by the trade as very risky. In London Soft Spanish ad-

vanced from £13. 10/ to £13. 12/6; it costs 5.05¢ duty paid to lay it down here, and English Pig is cabled £13. 16/. As for the so-called European Lead syndicate in embryo, the report is that the committee appointed to frame the by-laws for the same has not yet finished its labors, some leading producers still rusticating. A common selling office seems to be discarded from the very start, not being deemed practicable.

Spelter.—At the advances insisted upon Common Domestic does not sell very readily, but is dragging at 4.80¢ @ 5¢, while Silesian cannot be had for less than 5.70¢, having risen to £18 in London. Advices are favorable from Silesia, where a brisk trade is being transacted.

Antimony.—Hallett is cabled £38; here a moderate jobbing demand is noticeable at 9½¢ for Hallett and 13¢ @ 13½¢ for Cookson.

New York Metal Exchange.

The following sales are reported:

THURSDAY, August 30.	
10 tons Tin, spot	21.10¢
10 tons Tin, spot	21.20¢
25,000 lb Copper, August	16.90¢
32 tons Lead, September	4.82½¢
100 tons Lead, September	4.85¢
50 tons Lead, October	4.85¢
32 tons Lead, spot	4.87½¢
FRIDAY, August 31.	
10 tons Tin, September	22.00¢
100 tons Lead, September	4.85¢
80 tons Lead, September	4.87½¢
10 tons Lead, October	4.80¢
100 tons Tin, September	21.90¢
18 tons Lead, spot	4.90¢
98 tons Lead, spot	4.95¢
200 tons Lead, September	4.85¢
100 tons Lead, September	4.87½¢
18 tons Lead, September	4.95¢
100 tons Lead, October	4.90¢
50 tons Lead, spot	4.97½¢
TUESDAY, September 4.	
112 tons Lead, November	4.90¢
10 tons Tin, September	21.90¢
10 tons Tin, September	22.00¢
532 tons Lead, October	4.95¢
WEDNESDAY, September 5.	
20 tons Tin, October	22.15¢
30 tons Tin, October	22.20¢
25 tons Tin, October	22¢
100 tons Lead, November	4.85¢

Coal Market.

The Anthracite trade is active, and the recent advance is said to be firmly held. Production at the mines is still in large volume, the total for the week ending September 1 having been 844,665 tons, as compared with 596,369 tons for the corresponding week in 1887, an increase of nearly 250,000 tons, but the output is not quite equal to that of the middle of August. Since January 1 the aggregate is 23,950,114 tons, or an increase of more than 1,250,000 tons as compared with the same time last year. The output for several weeks past is as follows:

	Tons
Week ended August 4	754,883
Week ended August 11	831,615
Week ended August 18	920,922
Week ended August 25	832,058
Week ended September 1	844,665

On the 1st inst., when the advanced prices took effect, the several companies, as a rule, fell back on their reserved privilege and proceeded to fill unfinished orders at the "rates current at time of delivery." Operators and shipping companies in reference to complaints that the advance was unnecessary, are represented as saying that they "have been taxed to their utmost for more than a month to fill the orders for coal they have received even at the high prices which have recently been ruling, and that the situation warranted increased prices and tolls."

New York prices are as follows:

	Broken.	Egg.	Stove.	C'nut.
Hard white ash	\$4.15	\$4.40	\$4.65	\$4.55
Free white ash	3.95	4.30	4.65	4.55
Lykens Valley	5.00	5.50	5.50	5.25

Pea has sold as low as \$2, this size being in excess. Cargo prices, free on board at

New York, compare with those of a year ago, as follows:

	August, 1887.	August, 1888.	Inc.
Broken	\$3.65	\$3.85	\$0.20
Egg	3.80	4.15	.35
Stove	4.25	4.50	.25
Chestnut	3.85	4.40	.55

The Philadelphia *Ledger* says: "The new prices for Anthracite are being firmly maintained at about the full circular figures, and 'shopping' for Coal to get a shade off the circular prices is a thing of the past. Some Coal shippers are asking, Where is all the Furnace Coal going to? saying it puzzles them to know, as there are so many Iron furnaces idle and that some of those in blast are using Coke, and yet there is no visible surplus of Lump and Broken sizes, notwithstanding the enormous output of Coal this year. The production of Lykens Valley Coal, which has been limited for several months, is increasing, and on Thursday Graef, Wilcox & Co. and Graef, Miller & Co. resumed operations in the Lykens Valley region."

Bituminous Coal is in rather better demand, and the tonnage steadily increases. Clearfield production for the week was 65,897 tons, and for the year since January 1, 2,129,000 tons, against 2,011,000 for the same time in 1887; Cumberland do. for the week, 74,728 tons, and since January 1 2,195,000 tons; increase 240,000 tons. The Philadelphia *Record* says: "The short-sightedness of the policy of the Anthracite Coal managers in keeping up the price of that article is shown in the fact that the supply of Bituminous Coal for the seaboard has increased so far this year 1,700,000 tons, while the amount of Anthracite is almost the same as for 1887. The exorbitant price and the difficulty of getting full supplies have led some large manufacturer in this city to give up Anthracite Coal entirely and to use Bituminous in its place. Nearly the whole gain of the Anthracite producing companies is in their Western trade, and on this they levy such heavy tolls that there seems a possibility that they may kill that also. The price in Chicago is now over \$9 per ton, and has led to a lively kick there against the extortion of the Coal companies."

The shipments of Anthracite Coal to the West by lake from Buffalo are the largest on record and aggregate 313,000 tons for the month and 1,406,000 tons for the season.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from August 13 to August 30, inclusive, and from January 1 to August 30, inclusive, were as follows:

Iron and Steel.		Aug. 13 to Aug. 30.	Jan. 1 to Aug. 30.
	Tons.	Tons.	Tons.
Iron Ore: A. Earnshaw	226	6,339	
A. C. Outerbridge	30	340	
Pig Iron: A. Milne & Co	1,068	2,527	
Crocker Bros	50	7,873	
N. S. Bartlett	400	3,800	
James Williamson & Co.	400	3,600	
Naylor & Co.	370	5,384	
G. W. Stetson & Co.	250	11,950	
Jas. E. Pope, Jr.	150	150	
Peter Wright & Sons	20	20	
C. L. Perkins	5	5	
Steel: W. F. Wagner	55	1,065	
A. Milne & Co.	54	1,011	
R. H. Wolff & Co.	25	367	
F. S. Pilditch	16	312	
Chas. Hugill	14	207½	
C. F. Boker	13	172½	
M. Strouse & Co.	12	30	
J. Abbott & Co.	12	305	
M. Cohn & Co.	9	178	
Newton & Shipman	6	121	
C. S. Mersick & Co.	4	18½	
H. W. Belcher	2	7	
Thos. Prosser & Son	1	56	
Spiegeleisen: Crocker Bros.	484	3,420	
Dana & Co.	900	1,401	
Naylor & Co.	1,246	6,819	
C. L. Pierson & Co.	15	50	
Steel Rods: Naylor & Co.	1,028	14,257	
Dana & Co.	300	2,060	
S. A. Galpin	298	2,570	
J. Abbott & Co.	125	3,840	
R. H. Wolff & Co.	75	2,987	

A. Heyn.....	46	1,289
Cary & Moen.....	25	650
Steel Blooms: Dana & Co.....	125	102
Steel Sheets: Pierson & Co.....	215	836
Naylor & Co.....	41	468
Steel Billets: J. Abbott & Co.....	141	1,486
Steel Plates: A. R. Whitney & Co.....	12	12
Steel Hoops: Jas. Lee & Co.....	45	45
Ogden & Wallace.....	29	29
Wheelock & Co.....	10	220
Steel Forgings: Thos. Prosser & Son.....	216	3,448 1/2
Steel Bloom Ends: Dana & Co.....	745	947
Steel Tubes: Thos. Prosser & Son.....	2	2
Steel Tires: Thos. Prosser & Son.....	60	60
Steel Rails: Delaware, L. and W. R. H. Co.....	85	1,148
Scrap Steel: A. Milne & Co.....	25	102
Naylor & Co.....	2	176
Iron: G. Lundberg.....	251	588
Bacon & Co.....	107	130
R. F. Downing & Co.....	10	104
E. G. Jacobus.....	3	28
Iron Rods: Naylor & Co.....	270	545
Rivet Rods: J. Abbott & Co.....	300	3,029
G. Lundberg.....	150	446
R. F. Downing & Co.....	150	212
A. Milne & Co.....	134	304
J. A. Roebeling's Sons.....	54	786
Page, Newell & Co.....	3	43
Sheet Iron: T. B. Coddington & Co.....	70	985
R. Crooks & Co.....	10	10
Screw Rods: American Screw Co.....	100	495
Iron Beams: W. H. Wallace & Co.....	211	691
R. F. Downing & Co.....	62	256
Iron Girders: R. F. Downing & Co.....	27	394
Iron Sheets: A. Milne & Co.....	10	10
Scrap Iron: Bowering & Archibald.....	100	300
Tee Iron: Stroud & Co.....	8	8
E. G. Jacobus.....	5	5
Charcoal Iron: Muller, Schall & Co.....	101	128
Iron Wheels: R. F. Downing & Co.....	10	36
Cotton Ties: Naylor & Co.....	805	4,309
Hullard & W.....	300	645
Wheelock & Co.....	150	150
J. B. Leng's Sons.....	50	160
Steel Crop Ends: Naylor & Co.....	419	1,940
Ferromanganese: Naylor & Co.....	103	275

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co.....	40,783	362,511
Dickerson, Van Dusen & Co.....	16,833	183,120
Pratt Mfg. Co.....	14,321	120,564
T. B. Coddington & Co.....	10,788	118,635
A. A. Thomsen & Co.....	9,149	81,565
R. Crooks & Co.....	4,801	47,861
G. B. Morewood & Co.....	4,629	31,539
Bruce & Cook.....	4,437	70,022
Jas. Byrne & Son.....	3,406	28,298
N. L. Cort & Co.....	3,280	72,285
Hy. Whittemore & Co.....	2,521	43,485
Central Stamping Co.....	2,036	21,977
Lombard, Ayres & Co.....	1,554	10,272
H. R. Demilt & Co.....	1,029	14,319
Wolff & Roessing.....	964	21,396
Lalanc & G. Mfg. Co.....	810	3,378
E. S. Wheeler & Co.....	789	4,653
S. Shepard & Co.....	615	13,935
Somers Bros.....	800	300
Merchant & Co.....	206	16,483
Henly & Earle.....	38	38

Metals.

	Pounds.	Pounds.
Tin: Muller, Schall & Co.....	660,047	8,121,313
R. Crooks & Co.....	212,824	233,633
Naylor & Co.....	212,746	1,710,411
Phelps, Dodge & Co.....	179,193	1,338,314
American Metal Co.....	78,320	990,696
Jas. E. Pope, Jr.....	78,180	192,598
D. Thomsen & Co.....	22,454	159,023
Nickel: McCoy & Sanders.....	15,120	137,610
Spelter: J. Macy's Sons.....	56,000	56,000
Lead: Hendricks Bros.....	44,852	44,852
	Casks.	Casks.
Antimony: Edw. Hill's Sons & Co.....	200	1,175
American Metal Co.....	60	155
Hendricks Bros.....	34	170
Phelps, Dodge & Co.....	30	440
Dickerson, Van Dusen & Co.....	17	51

Hardware, Machinery, &c.

Brown Bros. & Co., cutlery, cs., 4	
Barbour Bros. & Co., Mach'y, cs., 8	
Blake, G. J. Mfg. Company, Iron Henter, 1	
Baker, Hermann & Co., Mdse., cs., 10; Arms, cs., 14; Hdw., cs., 9	
Corbeire, Fellows & Co., mach'y, pkgs., 19	
Cape, A. M., mach'y, pkgs., 8	
Clark Mill Company, Mach'y, cse., 1	
Erie Despatch Company, Cistern, 1; Mach'y, cs., 21	
Field, Alfred & Co., Mdse., cs., 14; Hdw., cs., 10	
Folsom, H. & D., Arms, cs., 10	
Graef Cutlery Company, Cutlery, cs., 8	
Hammer, Schlemmer & Co., Nails, cs., 40	
Hartley & Graham, Arms, cs., 20	
Hawley Bros. Hardware Company, Mdse., cs., 3	
Hertlein & Schlatter, Mach'y, cs., 4	
Kastor, A., Mdse., cs., 6	
Lundberg, G., Ironware, bxs., 13	
Meacham Arms Company, cs., 10	
Merchants' Despatch Company, Arms, cs., 14; Ironware, box., 1; Arms, cs., 7	
McSorley, G. & Son, Mach'y, cs., 4	
Neal, C., Hdw., ck., 1	
Ritchie, R. O., Mach'y, pkgs., 9	
Schoverling, A., Arms, cs., 35	
Shoverling, Daly & Gales, Arms, cs., 21	

Schloss & Sons, Mach'y, cs., 2	
Sheldon, G. W. & Co., Hdw., cs., 7; Chains, cks., 3	
Sloane, W. & J., Castings, 4	
Stoddard, Lovering & Co., Mach'y, cs., 2	
Tryon, E. K. J. & Co., Arms, cs., 9	
Tilly, H. A., Hdw., cs., 4	
Taylor, Thos., Hdw., cs., 2	
Van den Toorn, W. H., Arms, cs., 26	
Ward, Asline, Mdse., cs., 6	
Wiebusch & Hilger, Lim., Mdse., cs., 31	
Weiller, Strauss & Co., Hdw., cs., 4	
Witte, John G. & Bro., Cutlery, cs., 9	
Order: Mach'y, pkgs., 13; ditto, cse., 1	

Exports of Metals.

	August 13. to August 30.	Jan. 1. to August 30.
	Pounds.	Pounds.
Copper: J. Abbott & Co.....	50,000	10,053,619
Lewisohn Bros.....	3,929,022	3,929,022
F. A. Lomal.....	343,845	2,581,293
American Metal Company.....		5,148,985
C. H. Nichols.....		223,939
J. Bruce Ismay.....		112,000
S. Mendel.....		560,000
Ledoux & Co.....		119,276
Muller, Schall & Co.....		430,000
Copper Queen Con. M. Com-pany.....		224,034
J. Kennedy, Tod & Co.....		112,026
H. Becker & Co.....		1,250
Orford C. & S. Rtg. Company.....		449,881
Robt. M. Thompson.....		125,000
Thos. J. Pope, Sons & Co.....		822,130
J. Parsons & Co.....		206,250
Bridgeport Copper Com-pany.....		112,000
C. Herold.....		250,000
Phelps Bros.....		6,250
R. W. Jones.....		189,984
W. H. Crossman & Bro.....		4,000
Copper Matte: Williams & Terhune.....	789,521	34,382,598
Lewisohn Bros.....		3,021,610
American Metal Company.....	391,932	2,236,873
J. Abbott & Co.....		295,000
C. Ledoux & Co.....		485,800
F. W. J. Hurst.....		184,288
G. H. Nichols.....		722,777
H. T. Nichols & Co.....		180,965
Kunhardt & Co.....	41,652	41,652
Copper Ore: C. H. Mallory & Co.....	204,747	204,747
Old Copper: Burgess & Co.....	41,694	554,568
Old Brass: Burgess & Co.....	15,705	240,395
	Tons.	Tons.
Pig Iron: Peter Wright & Son.....	180	180

Financial.

The business situation and hopeful outlook have not been adversely affected by any of the events of the past week. Crop accounts are no less flattering, and the industries through the entire range are without disturbance, and to all appearances are at least moderately prosperous. The exemption from labor troubles is at least worthy of notice. In the cotton industries there are a number of new mills building, especially in the South, and woolen mills are more active. Glass manufacturers, as is usual at this season, are starting again. Railroad tariffs are not yet altogether on a settled basis. Chairman Cooley, of the Interstate Commerce Commission, on his attention being called to the dispatch from Chicago regarding rates over the Southern Pacific road, said it is not in the power of the traffic manager to make rates between New York and Pacific Coast points as low as he pleases and at the same time put rates between interior towns and the Pacific Coast as high as he pleases. There are considerations of relative equality and justice that cannot be ignored and that have been kept steadily in view in all that the commission has said in its ruling hitherto. They will be kept just as steadily in view hereafter.

The Stock Exchange markets were dull but generally strong. Lackawanna after an advance of about 8% within ten days, was a fraction lower. The grangers were regarded with more confidence since the decision by Judge Fairall in the case of the Rock Island Railroad against the Iowa State Commissioners. His decision is identical with that of Judge Brewer in the cases recently reported, and is, in brief, that the commissioners are not empowered to fix the rates so low as to prevent the carrier from receiving a reward for the services rendered, and that in doing so the commissioners became wrongdoers, "for the reasons that their acts were in violation of the commands of the statute that required them to make just and reasonable rates, and in violation of

the constitutional provisions which restrain the State as well as its officers from making and attempting to enforce by law rates which were not compensatory." On Friday the denial of the report about the probable disruption of the Trunk line pool had a favorable effect, and there was less disposition than expected shown to sell on account of the Retaliation bill proposed in the House. The Saturday half-holiday and the holiday on Monday made trading small. On Tuesday there was a gradual rise in the Oregon, Northern Pacific, Reading and Lackawanna, and the tendency was generally upward to near the close, when there was an irregular decline. It was reported that a through route from the West to Baltimore, Philadelphia and New York via the Baltimore and Ohio Railroad has at last been effected. The Pennsylvania Railroad, it is said, will not offer opposition to the deal just consummated. The Reading Railroad Company has decided to widen all its tunnels and to widen and improve its tracks in order to increase its freight carrying capacity.

United States bonds are quoted as follows:

U. S. 4 1/2s, 1891, registered.....	106 1/2
U. S. 4 1/2s, 1891, coupon.....	107 1/2
U. S. 4s, 1907, registered.....	128 1/2
U. S. 4s, 1907, coupon.....	128 1/2
U. S. currency 6s.....	120

The total bank clearances last week in 38 cities show a decrease of 16.4 per cent. compared with last year, against an increase of 1.4 per cent. the previous week. Clearings outside of New York show a decrease of 1.5 per cent. as compared with last year, against an increase of 9.6 per cent. the previous week. The loss at New York was exceptionally large, and must be mainly ascribed to dullness in speculation.

Higher prices for wheat and breadstuffs, caused by bad weather reports from Europe, have been succeeded by an easier feeling and irregular prices, with a light business. There was great excitement on Tuesday in wheat. Owing to the unfavorable reports from the crops, the price reached \$1.04 1/2 and closed at \$1.04 1/2, as against \$1.01 on Saturday. Compared with a week ago, wheat is 1/4¢ @ 1/2¢ lower. Corn is a shade lower, but about steady. Provisions were raised in Chicago, but in New York were quiet. In the grocery trade sugars were higher, both raw and refined. Coffee is unsettled. Cotton closed steady, and spots were reduced 1/8¢ to confirm nearer to the September options. Active business was done at 10 1/2¢ @ 10 1/2¢. The new crop was somewhat weaker as a result of favorable crop reports. The rise in the price of jute bagging is said to be delaying deliveries. Ocean freights touched a higher point than before for a long while, but advanced prices for commodities generally have kept exports within narrow limits. Among dry goods jobbers there was a marked improvement, especially noticeable in New York, and alike satisfactory as reported from other seaboard markets.

The weekly bank statement showed the first heavy drain to move the crops, the demand from the South having been delayed by late cotton. The surplus reserve was reduced over \$4,200,000, so that the excess now stands at \$16,766,625, as against \$5,200,000 at the corresponding week last year and nearly \$7,000,000 a year before. Specie showed a decrease of \$4,397,800. In loans the expansion was larger than the previous week, amounting to \$2,983,900. Taken altogether the statement bears out the reports in regard to increased activity in general trade, and the loss in surplus reserve, although large, occasions little surprise at this season of the year.

Commercial paper was in fair supply, but the demand was not urgent. Rates were

for 50 to 90 days' indorsed bills receivable $4\frac{1}{2}$ to 5%; for first-class four months' commission house names $4\frac{1}{2}$ to $5\frac{1}{2}$ %, and for good single names $5\frac{1}{2}$ to $6\frac{1}{2}$ %. Banks are discounting little except for their own customers. Sterling exchange is dull at $\$4.85\frac{1}{2}$ @ $\$4.88\frac{1}{2}$, the same as for the previous week. The supply of cotton bills is a little better. The Bank of England rate remains at 3%, against 4% at this date last year. The gross earnings of 74 railroads for the third week in August show an increase compared with last year, when they were considered remarkably favorable. The *Daily Stockholder* reports interest and dividend payments during the month of September of $\$17,363,328$, against $\$15,077,038$ for the corresponding month last year. In addition to this, however, the Government has paid $\$2,500,000$ for quarterly interest on $4\frac{1}{2}$ % bonds. The exports of specie from this port last week were $\$504,000$; imports nominal.

The imports of merchandise at this port during the week were valued at $\$8,667,365$, of which over $\$3,000,000$ represents dry goods. Since January 1 the aggregate is $\$317,372,000$, as compared with $\$319,107,000$ for the same time last year, and of $\$293,689,800$ in 1886.

The *American Banker* states some interesting facts respecting the increase in the number of banks in different parts of the country during the first half of the current year. The whole number of new banks organized during that time was 522, against 267 during the first half of 1887. The amount of their capital was $\$27,014,150$, or an average of less than $\$52,000$ each, against $\$23,427,200$ during the same time last year, or an average of over $\$87,700$ each. The most of these new banks were organized in the Southern and Western States.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, Sept. 5, 1888.

Parties who sold Chili Bar futures "short" some time ago, on which deliveries became due within the past week, have been given a practical lesson in what the "syndicate" is capable of doing in the way of making an artificial stringency. In fact, the "shorts" have been severely squeezed and had to pay as high as $\pounds 93$ @ $\pounds 95$ for cash warrants, whereas futures have ruled at about $\pounds 79.10$ and G. M. B. contracts at $\pounds 76.10$. Meanwhile consumers have been supplied, on certain conditions, with Chili Bars at $\pounds 78.10$ for prompt delivery, or $\pounds 15$ @ $\pounds 17$ below the prices which the "shorts" have been obliged to pay on the open market. Surface indications fail to reflect any material increase in the amount of Copper passing into consumption. To the contrary, the actual deliveries are not above a full average amount and surplus supplies continue to rapidly increase on the hands of the syndicate. It is now estimated that the syndicate holds no less than 100,000 tons of various Copper in England and France in addition to the extensive quantity of American product in the American market. It is stated that the officials of some of the mining companies are becoming alarmed at the rapid accumulation of surplus stocks and talk of the propriety of measures being taken to reduce the output. The chairman of the Bratsberg Company, it is stated, remarked at a recent meeting that he believed a crash to be certain unless the mine owners combined to curtail production. There

has been a quite extensive business in furnace material the past fortnight, and, in all instances, at firm prices. James Lewis & Sons' circular notes, among other sales, 1750 tons Anaconda Matte at 15 $\frac{1}{2}$ %, f.o.b. Liverpool, and 34 tons American Precipitate at the same price.

The Block Tin market has fluctuated widely under the influence of active speculation, with both "bulls" and "bears" striving for supremacy. The Dutch interest is believed to favor those traders whose operations are for a rise, and the result of the Batavia sale of Billiton tended to strengthen the impression. The sale realized an equivalent of $\pounds 101$ delivered in Holland, and the first announcement of the result caused considerable excitement, particularly among the smaller traders who stood "short" on the market.

The Tin-Plate market continues very strong. Production is still closely taken up, and in view of this fact, together with the advance on Block Tin and Iron, nearly all makers are holding for still higher prices. There has been a misunderstanding between the proprietors of Margam Works (Port Talbot, Glamorganshire) and their employees, resulting in a temporary stoppage of work at their nine mills.

The demand for Scotch Pig Iron has continued active and prices show a still further hardening. Middlesboro' product has also undergone a further advance on large transactions, and large sales are reported of Hematites also. It is stated that about 1000 tons Middlesboro' Pig were sold for the American market, the first transaction of the kind in several months. The advance in prices during the week is 6d. to 1/6 on Scotch Pig, 1/ on Hematites and 6d. on Middlesboro'. Spiegeleisen is offered somewhat lower. Steel Rails, Blooms, Billets, &c., are held higher, owing to the advance on crude material. Old Iron Rails are also 2/6 higher, and steamer freights have advanced 2/ @ 3/.

Scotch Pig.—The market strong at the advance and active.

No. 1 Coltness, f.o.b. Glasgow	50/
No. 1 Summerlee, " "	51/
No. 1 Gartsherrie, " "	47/6
No. 1 Langloan, " "	47/6
No. 1 Carnbroe, " "	43/
No. 1 Shotts, " at Leith	47/6
No. 1 Glengarnock, " Ardrossan	45/3
No. 1 Dalmellington, " "	42/6
No. 1 Eglinton, " "	41/6

Steamer freights, Glasgow to New York, 8/ @ 9/; Liverpool to New York, 10/.

Cleveland Pig.—Bessemer has been brisk and prices show a further 6d. advance. No. 1 Middlesboro', G.M.B., 37/; No. 3 do., 34/6.

Bessemer Pig.—There has been a large trade and the market is very strong. West Coast brands, mixed numbers, 45/6, f.o.b. shipping point.

Spiegeleisen.—The demand very slow and prices rather easier. English 20% quoted 75/, f.o.b. N. W. England shipping point.

Steel Rails.—Moderately active demand and prices held higher. Standard sections quoted at $\pounds 3.18/9$, f.o.b. at N. W. England shipping point.

Steel Blooms.—More business doing and the market firmer. We quote $\pounds 3.15$ / for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—A quiet, active trade, and prices somewhat higher. Bessemer, 2 $\frac{1}{2}$ x 2 $\frac{1}{2}$ inch, $\pounds 4$, f.o.b. at N. W. England shipping point.

Steel Slabs.—Prices are held higher, but there is less doing. Bessemer, $\pounds 3.17/6$, f.o.b. at N. W. England shipping point.

Steel Wire Rods.—Demand rather slow but prices held firmly. Mild Steel No. 6 quoted at $\pounds 5.18/9$ and No. 5 at $\pounds 5.25$ /, f.o.b. at N. W. England shipping point.

Old Rails.—Supplies sparingly offered. Demand is larger. Tees quoted at $\pounds 2.17/6$, and Double Heads $\pounds 3$, free on board.

Scrap Iron.—There is more demand and prices are firmer. Heavy Wrought quoted at $\pounds 2.5$ /, f.o.b.

Crop Ends.—More business doing and prices are firmer. Bessemer quoted $\pounds 2.7/6$ @ $\pounds 2.10$ /, f.o.b.

Tin Plate.—The market firm with fairly good demand.

Manufactured Iron.—There continues to be an active business and prices are strong. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff. Ord. Marked Bars....	@ 7	12 6
" Common	@ 5	0 0
" B'l'k Sheet, singles	@ 6	15 0
Welsh Bars (f.o.b. Wales)....	4 12 6	@ 4 15 0

Tin.—The market irregular, but showing strong undertone. Straits quoted at $\pounds 97.17/6$ @ $\pounds 98$, spot, and $\pounds 98.10$ / for three months' futures.

Copper.—Prompt Chili Bars strong; futures firm. Trading brisk. Chili Bars, $\pounds 95$ @ $\pounds 95.5$ /, spot, and $\pounds 79.5$ / three months' futures. Best Selected, $\pounds 79$ @ $\pounds 80$.

Lead.—There is a fairly good business. Prices very firm. Soft Spanish, $\pounds 13.10$ / @ $\pounds 13.15$ /.

Spelter.—Demand has continued good and the market strong. Silesian, ordinary, $\pounds 17.15$ / @ $\pounds 18$.

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper.....	29 lb.	\$0.10 @ \$0.12
Light Copper.....	29 lb.	.. .. .08
Copper Bottoms.....	29 lb.	.. .. .06
Brass, Heavy.....	29 lb.	.. .. .06 $\frac{1}{2}$
Brass, Light.....	29 lb.	.. .. .06
Composition.....	29 lb.	.. .. .06 $\frac{1}{2}$
Lead, Heavy.....	29 lb.	.. .. .04 $\frac{1}{2}$
Tea Lead.....	29 lb.	.. .. .04 $\frac{1}{2}$
Zinc.....	29 lb.	.. .. .03
Wrought Iron.....	29 lb.	16.00 @ ..
Light Iron.....	29 lb.	7.50 @ ..
Stove Plate Iron.....	29 lb.	8.50 @ ..
Machinery Iron.....	29 lb.	12.00 @ ..
Grate Bars.....	29 lb.	.. .. 5.00
Old Rubber Springs.....	29 lb.	.. .. .04 $\frac{1}{2}$
Old Rubber Shoes.....	29 lb.	.. .. .01 $\frac{1}{2}$
White No. 1.....	29 lb.	.. .. .03 $\frac{1}{2}$
White, No. 2.....	29 lb.	.. .. .01 $\frac{1}{2}$
Canvas, Linen, No. 1.....	29 lb.	.. .. .04 @ .04 $\frac{1}{2}$
Canvas, Cotton, No. 1.....	29 lb.	.. .. .04 $\frac{1}{2}$ @ .04 $\frac{1}{2}$
Canvas, No. 2.....	29 lb.	.. .. .02 $\frac{1}{2}$ @ .02 $\frac{1}{2}$
Seconds.....	29 lb.	.. .. .01 @ .01 $\frac{1}{2}$
Soft Woollens.....	29 lb.	.. .. .06 $\frac{1}{2}$ @ .07
Mixed Rags.....	29 lb.	.. .. .01 @ .01 $\frac{1}{2}$
Gunny Bagging, No. 1.....	29 lb.	.. .. .02 @ .02 $\frac{1}{2}$
Jute Butts.....	29 lb.	.. .. .02 @ .02 $\frac{1}{2}$
Book Stock.....	29 lb.	.. .. .01 $\frac{1}{2}$ @ .01 $\frac{1}{2}$
Newspapers.....	29 lb.	.. .. .00 $\frac{1}{2}$ @ .01 $\frac{1}{2}$
Waste Paper.....	29 lb.	.. .. .00 $\frac{1}{2}$ @ .00 $\frac{1}{2}$
Hemp Twine.....	29 lb.	.. .. .06 @ .06 $\frac{1}{2}$
Sisal Baling Rope.....	29 lb.	.. .. .06 $\frac{1}{2}$

The new passenger station of the Central Railroad of New Jersey, in Jersey City, will be an imposing structure of brick, three stories in height, with a central tower 140 feet above the ground, and the frontage will be 217 feet. The main waiting room will be floored with bluestone flagging, and the sides will be formed of glazed brick imported from Germany. The structure will be made as nearly fire-proof as possible, the partition walls being of fire-proof material, while the floor beams and roof will be of iron. The train shed, 510 feet in length, will be roofed with iron, supported on iron beams and girders. The total cost of this improvement is estimated at $\$300,000$.

Hardware.

A good feeling prevails in the market, and manufacturers and merchants speak hopefully of the outlook for the season's trade. Buyers are placing orders more freely and the aggregate of the business is good. The general steadiness in prices and the improved condition in certain lines, together with the excellent prospects for business at large, are features to be noted as rendering the situation satisfactory.

Barb Wire.

The Eastern market is without special features, the demand being quite limited. Prices are nominally unchanged, the indications being, however, that lower quotations than have prevailed during the past season will rule during the coming season.

Cut Nails.

There is a slightly improved feeling in the New York Cut Nail market, due to a fair run of orders, and due to the greater confidence which buyers show. The setback experienced in the spring in building delayed considerable work, which has again been taken up, and distributors of Nails find that the consumption is a little heavier than expected. They see no danger in buying for the next 30 or 60 days, while there is always the possibility of an advance. Although Steel Nail Slabs have risen materially in the West, they have not as yet gone higher in Eastern and Central Pennsylvania, though large contracts have been placed lately. The rise in Old Rails has but little influence on the Nail trade, because they are used to a far less extent than they were formerly. Prices of Nails in the New York market remain the same, \$1.85 @ \$1.90 for carload lots on dock, and \$1.90 @ \$1.95 for small lots from store.

At the meeting of the Western manufacturers, held at Pittsburgh last week, 19 out of 34 mills were represented. A resolution was unanimously passed in favor of joining a pool, provided the assent of the absent manufacturers could be obtained. The position in the West differs from that in the East in that there has been a marked advance there in Steel Nail Slabs.

The Western manufacturers of Cut Nails express themselves very confidently in regard to sustaining the advance in price which they have recently made. It is further intimated that as soon as the advance is realized by the trade to rest on a firm basis, another step upward will be taken. Usually heavy contracts have been entered at very low prices before an advance is made by the manufacturers, but they assert that this fall they have not committed that mistake. The benefit accruing from higher prices will thus be reaped by themselves and not by the merchants. It remains to be seen whether the manufacturers really have thoroughly learned this lesson. If they have done so, they will have accomplished a great deal toward again making the manufacture of Cut Nails a reasonably profitable branch of the Iron and Steel trades. They will still have the competition of the Wire Nail to contend with, but there is a wide field for both to work in.

Wire Nails.

The improved condition of Wire Nails, especially in the West, is to be noted, and the maintenance by the manufacturers of the recently advanced quotations, \$2.55 for carload lots, and \$2.65 for smaller lots. The Eastern market feels the effect of this improvement, but no announcement of a corresponding change has been made.

Miscellaneous Prices.

Lee-Clarke-Andresen Hardware Company, successors to Lee, Fried & Co.,

Omaha, Neb., have issued their Gun catalogue No. 1, which is an elegantly printed large-paged pamphlet of 32 pages. It is accompanied by the discount sheet given below, which, besides giving prices on the goods, will be of interest as showing definitely the lines of Fire Arms and Implements offered by the company:

	Per cent.
Breech-Loading Double Guns.....	33 1/2
Pieper's Breech-Loading Double Guns....	40 & 10
Colt's Breech-Loading Hammer Guns....	25 & 10
Colt's Breech-Loading Hammerless Gun ..	25
Winchester Repeating Shot Gun.....	25 & 10
Hopkins & Allen Single Shot Gun	33 1/2
Flobert Rifles, XL Breech-Loading Gun, &c.....	33 1/2
Winchester Rifles	25 & 10
Colt's Rifles	25
Marlin Rifles	25 & 10
Colt's Revolvers.....	25
Revolvers	25
Revolvers	50
Gun Implements.....	50 & 10
Gun Implements (except Ideal Tools).....	50 & 10
Ideal Tools	25
Reloading Tools	25
Cartridges	
Brass and Paper Shells, and Loaded Shells	
Shot, Powder, Duncomb's Shot Case, \$4.25 net.....	
Primers and Percussion Caps.....	
Gun Material (except Wad Cutters)	50
Wad Cutters	30
Powder Flasks and Shot Pouches.....	33 1/2
Cork Screws	30
Pocket Cork Screws and Key Rings.....	30
Dog Collars	33 1/2

Attention is also called to the lines of goods for which the company are manufacturers' agents, and the last page of the catalogue is devoted to their Cutlery department.

The Burnside Mfg. Company, Burnside, Ky., for whom Wm. H. Jacobus, 90 Chambers street, New York, is agent, issue a circular representing a new cedar Faucet which they are now manufacturing. They call attention to the improvement in the finish, it being explained that every trace of the saw and lathe marks is removed, while an improved polishing machine gives a hard, smooth surface, which makes the Faucets attractive in appearance. An oblong hole is made in the side of the key, which is referred to as affording a freer flow and rendering the key absolutely interchangeable. This is an advantage which will be appreciated when Faucets are to be packed with other goods, as the keys can be taken out, thereby reducing materially the space occupied. The circular also alludes to other advantages possessed by the company's Faucets, mentioning the desirability of red cedar for Faucet use, the fact that there is no lining of cork or leather to become loose and that there is no metal to corrode. The Faucets are sold from the following price list, which is subject to a discount of 50 per cent.:

	6	7	8	9	10 inch.
	\$10.80	11.62	12.24	15.12	18.72 per gross.

The Faucets are packed in barrels which contain about the following number of Faucets: 6 inches, 35 dozen; 7 inches, 30 dozen; 8 inches, 24 dozen; 9 inches, 20 dozen; 10 inches, 15 dozen.

It is intimated that the American Needle and Fish Hook Company, New Haven, Conn., for whom the Alford & Berkeley Company, 77 Chambers street, New York, are agents, are about to enter upon a new departure looking to a more general marketing of their goods, instead of permitting the European manufacturers to sell their goods in this country to the extent to which this has been heretofore done. Thomas Wallace, of the well-known firm of Wallace & Sons, Brass manufacturers, has been elected to the presidency of the company and Mr. Hull has been chosen superintendent. In the revised price list the Ringed and Flatted Kirby and Limerick Hooks are put upon the same list. The discount on these Hooks is 50 and 10 per cent.; on the New York Trout or

Carlisle Hooks the discount in 60 per cent. and on the remainder of the list 50 per cent.

The Claflen Mfg. Company, Cleveland, Ohio, quote their Security Sash Locks and Security Door and Window Bolts at discount 70 per cent.

An advance in the prices of Shot took place August 30. The following are the present prices, subject to a discount of 2 cents per bag, 25 pounds, if paid within 5 days from receipt of bill:

Drop Shot, per 25-pound bag.....	\$1.40
Drop Shot, per 5-pound bag.....	.33
Buck and Chilled, per 25-pound bag.....	1.65
Buck and Chilled, per 5-pound bag.....	.38

An advance has also been made in the price of Sheet Lead, Lead Pipe, &c., the present prices of which are as follows:

Lead Pipe, per pound.....	\$0.07 1/4
Sheet Lead, per pound.....	.08
Block Tin Pipe, per pound.....	.45

It is gratifying to note the satisfactory condition of the Auger and Bit market. Prices are maintained with steadiness and regularity and this line of goods is thus in a condition more satisfactory than it has been for some time. A conservative policy, which may perhaps be regarded as the natural reaction from the animated competition which has frequently prevailed in this line, is the cause of the improved condition rather than any artificial or formal strengthening of the market in the way of combination between the manufacturers.

Stove Hollow-ware continues without material change, this line being characterized by steadiness in price and a maintenance of the advances which have from time to time occurred. In the present condition of things it is anticipated that there will be before long a further moderate advance. Enamelled and Tinned Hollow-Ware remain without change.

The prices of Agricultural Wrenches are well maintained by the manufacturers and the condition of the market in this line is regarded as satisfactory. Only a slight irregularity is caused by the stocks held by many of the jobbing houses and purchased by them at the considerably lower prices which recently prevailed. The influence of these goods is not sufficient to seriously interfere with the maintenance of prices by the manufacturers, and it is expected that the supply now offered at irregular figures will soon be exhausted.

The disturbances in the Agate and Graniteware trade at Chicago and St. Louis have at length been happily ended and the manufacturers and jobbers are again pursuing the even tenor of their way. The unsettled condition of this trade can be traced back to about a year since. At that time a prominent Western jobber began to give an extra discount to his customers, notwithstanding an agreement made between the manufacturers and all jobbers that these goods should be sold at a price not below a fixed rate. Probably the house referred to was not the only erring member of the family, but as the practice became known to other jobbers they appealed to the manufacturers to be released from their agreement, so that they might establish any price found necessary to meet competition. About the 1st of June the manufacturers acceded to their request and gave the jobbers the liberty they asked for. A very short time sufficed to show the undesirability of such an arrangement, and the manufacturers then attempted to rebuild the fabric which had been destroyed. Opportunity was thus given to jobbers desiring a change in the former agreement to insist upon the adoption of their views as a condition of their signing. A stand was also taken against recognizing as jobbers in these goods those who had been prominent in cutting prices, in violation of the agreement. For a time a rupt-

ure in the friendly relations of prominent jobbing houses seemed impending as an outgrowth of the attempt to settle this one question. Conditional agreements were at length signed by some of the jobbers who were most conciliatory in their temperament and earnestly desired to re-establish peace, and, with these signatures for a beginning, the manufacturers continued their efforts with ardor until all had signed. The *statu quo ante bellum* has now been regained, manufacturers and jobbers occupying their former relations and prices being restored to their old figure.

Obituary.

Amos Call, president of the Bemis & Call Hardware and Tool Company, Springfield, Mass., died at his home in that city on Thursday last. He was stricken with paralysis on Sunday and was unconscious the greater part of the time until his death. Mr. Call was a native of the city in which he died, having been born in 1814. In 1828 he was apprenticed to Stephen C. Bemis to learn machinists' trade, Mr. Bemis being engaged in Willimansett at that time, where, as well as at Hartford and Meriden, Conn., Mr. Call's early life was spent. In 1844 he returned to Springfield, and, in connection with Mr. Bemis, the business was established with which he was connected at the time of his death. The manufacture of tools which was begun at Willimansett thus became an important industry, and Mr. Call was active in its development. The first manufacturing was done in what is now Alden's Building, on Mill River, but in 1864 the company moved to the American Machine Works, on Liberty street. Five years later they returned to Mill River, having bought the property in which they have been located ever since. During the war the company did a large business in the manufacture of harness irons. They suffered from a disastrous fire in 1872, but the business has been prosperous since. Mr. Call took an active interest in the affairs of the city, in which he has held different offices. He was a prominent member of the First Baptist Church and was also a leading Mason. He celebrated his golden wedding May 16 of the present year. His personal qualities are thus referred to in an article relating to his death in the *Springfield Union*:

One of Mr. Call's leading characteristics was his thoroughness, and whatever he undertook received close and conscientious attention. He was devoted to his business, but did not neglect any of the other relations and duties of life. No sacrifice was considered by him too great to make for his family and friends, and his home life was delightful. He was a kind and considerate neighbor, and those who knew him most intimately feel that they have lost a friend on whom every dependence could be placed. He was held in high regard by rich and poor alike, and in his death the community loses one of its best citizens.

Trade.

Our reports from Louisville, Ky., under date September 3, are to the following effect:

The Hardware trade of Louisville, Ky., is feeling the general impulse of advance that comes over the country, and which is appreciated by a commercial center possessing great advantages and being awake to its possibilities. True, the Cut Nail and Wire Nail manufacturers stole a march on the trade here, having met and advanced prices before the dealers, with few exceptions, were aware of it. This action, though much desired and expected, was unlooked for so suddenly, but enough Nails were secured for legitimate pur-

poses. Probably 15,000 kegs of Cut Nails were placed here, which amount is not too large for this market. Wire Nails came in for a good share of patronage and have secured a very desirable custom. The Nail mills say their action in advancing 15 cents per keg was forced by Steel going up \$2 per ton, all of which is legitimate and ought to hold.

Bar Iron has also advanced \$1 per ton and will probably soon take another step forward, caused by the upward movement of Old Rails. The demand from store for Bar Iron has improved and cut prices are withdrawn by the dealers.

Carriage and Wagon Goods continue in active demand and those dealers making a specialty of heavy goods report a very satisfactory trade for the past month.

Wire of all kinds remains too low, in comparison to other goods, but shipments from store are large in volume, although at small profits to the dealers.

The city is entering on a month of commercial celebration and is putting on holiday attire. On certain days during the next four weeks the city will be given up to magnificent pageants, which is a new venture for Louisville, but as all the merchants and manufacturers have gone into the spirit of the enterprise, it is bound to be a success.

All of the business streets are profusely decorated and illuminated at night, and grand results are anticipated from the varied attractions offered visitors.

The following review of the Hardware trade of New Orleans, for the year ending September 1, is given by the *Times-Democrat* of that city:

The volume of business for the year ending June 30, 1888, was quite satisfactory to the New Orleans jobbers. In our report of September 1, 1887, we called attention to the fact that the volume of business for the year ending June 30, 1887, was 25 per cent. greater than the previous year. It is an encouraging feature in this branch of business to see that this increase continues. A careful estimate, based chiefly on actual figures, shows the increase in the amount of goods handled by the trade for the year ending June 30, 1888, to be over 30 per cent. greater than that of 1887. It should be borne in mind that this large increase was made in the face of a brisk competition from the North and West, where a partial failure of the crops paralyzed business and caused those sections to look to a more distant and favored field in the South to unload their surplus stocks, bought in anticipation of their usual home demand. That our Hardware merchants were able not only to hold their own, but to increase their trade under such circumstances is an evidence of their ability to compete with any market. The small profit resulting from a surplus of goods on the market was felt, but the increase of sales compensated for this loss. During the year there has been a gradual decline in values, notably in Iron, Nails, Iron Pipe, Barbed Wire and several articles of Hardware not sustained by combinations and in which the cost of production is not chiefly due to labor. The outlook for the future is encouraging; crops throughout all sections of the South, with few exceptions, are good and a fine harvest may be expected.

The *San Francisco Journal of Commerce*, in a recent issue, gives the following review of the trade in Hardware and Metals for the past half year:

There were no very great changes as to prices in Hardware and Agricultural Implements during the half year. There was, however, a very good business done, and a considerable increase shown over that of last year on account of the vast increasing population of the State and the many new homes being built in every quarter. The quantity of Scrap Iron imported has been almost 7000 tons in excess of that for the same time in 1887. All this goes to the rolling mills for the production of Bar Iron, &c., showing a very great increase in home production. In the spring heavy sales of Pig Iron were made for the South. In the Nail trade imports have been light, while home production has been very large. The market opened in January with \$2.75 as the basis price for carload lots, and \$2.90 for less quantities. On March 1 carload lots were advanced to \$2.90 and smaller quantities to \$3. In April carload lots were advanced to \$3, smaller quantities to \$3.10. This was the highest, as on June 5 there was a reduction to \$2.90 for carload lots and \$3 for smaller quantities. There was considerable fluctuation in the price of Pig Tin. It opened at 35 cents to 37½ cents in January. In February the market advanced to 40 cents, but dropped to 38 cents at the close. In March it dropped to 36 cents. It remained at 36 cents to 37 cents through March and April. In May a panic took place in the market, and prices dropped to 30 cents and 33 cents, and then to 22½ cents and 25 cents, at which it

remained in June. The imports of Tin Plate have been the largest in the history of the market. The latter has fluctuated considerably. It opened at \$5 for Coke. In February an advance to \$6 was made. In May there was a drop in price to \$5.50 for Coke. In June there was a further drop to \$5.25.

Robert H. Seymour, treasurer of the Henry Seymour Cutlery Company, Holyoke, Mass., in a recent interview refers to the fact that they export their Scissors and Shears largely to England, Australia, South America and Mexico. They are able to do this, competing successfully with the English manufacturers in their own market because of the special processes employed by them which the English manufacturers have not yet been able to imitate. They also supply the Canadian trade to a considerable extent, although there is a duty of 30 per cent. upon their goods imported into that country.

Items.

Morley Bros., East Saginaw, Mich., advise us that in printing the price lists to which we referred in a former issue they unwittingly used matter which had been copyrighted by T. W. Root, and as soon as this fact was called to their attention they discontinued the distribution of the lists. They allude to Mr. Root's price lists as the best thing of the kind they have seen, and take pleasure in referring the trade to Mr. Root.

A Hardware house, who may be addressed as "Hardware," Box 1385, Post Office, New York, advertise among the Special Notices, on page 56, for an experienced Hardware salesman well acquainted with the Western and Middle New York State Hardware retailers. The opening is deserving the attention of those desiring such a position.

The American Bit Brace Company, Buffalo, N. Y., for whom Sise, Gibson & Co., 100 Chambers street, New York, are agents, in their announcement on page 58 allude to the accumulation of orders, especially for their Pederson Ratchet Brace, causing their patrons inconvenience by delay in receiving the goods. They have, however, purchased new machines, thus increasing their capacity and putting them in position to take care of orders more promptly.

As appears by the announcement on page 55, there will be, September 14, an auction sale of the machinery of E. Remington & Sons, Ilion, N. Y. Some farming implements and other articles are also advertised.

The Biddle Hardware Company, Philadelphia, Pa., have issued a circular for the fall trade, in which seasonable goods especially are illustrated. The exhibit of Lamps, with which the pamphlet opens, is especially fine and satisfactory. It is to be observed that the catalogue gives the prices of the Lamps complete with the shades and the various fixtures, a feature which will be appreciated by the trade. The other goods represented in it are also of interest. A discount sheet will be mailed to merchants applying for it.

Announcement is made that the copartnership heretofore existing between Chas. L. Knapp, William H. Knapp and Clinton I. Hague, who have been doing business in this city under the firm name of Knapp & Hague, and in New Haven, Conn., under the firm name of Union Form Company, has been dissolved. Chas. L. Knapp and William H. Knapp also announce that they have purchased the interest of Clinton I. Hague and will continue the business at 52 Fulton street, New York, and New Haven, Conn., under the name of Knapp Brothers.

The W. F. & John Barnes Company, Rockford, Ill., have issued a new catalogue of their Foot, Hand and Steam

Power Machinery in the form of a well printed and fully illustrated pamphlet of 64 pages, a considerable enlargement on their former issues. The well-known line of machines described in it, with others which have recently been added, will be regarded by the trade with interest.

The Moore & Barnes Mfg. Company, 103 Chambers street, New York, issue circulars relating to some of their recent additions to their line. One of these calls attention to an assortment of spooled wire, which is put up in a painted wooden box with a hinged cover. This assortment contains 140 spools of Black and Tinned Annealed Steel, Copper and Brass Wire, and comprises sizes likely to be called for. The assortment is described in the circular with the retail prices, showing that the dealer can realize \$10 on the assortment, the price at which it is sold giving a good margin of profit. Another circular relates to the Phoenix Bench Anvils for amateurs, jewelers and light bench use. Three sizes are made, weighing respectively 1½, 3½ and 7½ pounds. The Phoenix Window Cleaners and Floor Scrubbers are also alluded to, illustrations being given of them. A third circular relates to the Phoenix Vegetable and Potato Slicers, Dunlap Pattern, and the Phoenix Carpet Stretcher. The advantageous terms on which these goods are offered are referred to by the company.

Paine, Diehl & Co., Philadelphia, issue a 14-page folded leaflet, which is designated "A Few Decidedly Good Things." In it their leading household specialties are illustrated.

The Bridgeport Chain Company, Bridgeport, Conn., call attention to a new Chain for hanging pictures, which they designate as the Triumph Wire Chain. It is referred to as very strong and the point is made that pictures hung with this Chain are not so liable to shift their position as when hung with Cord, Wire, &c. It is sold upon Spools holding 15 yards, the Chain being of different sizes and offered in finish of different kinds.

S. A. Haines, 90 Chambers street, New York, selling agent for the Little Cyclone Churn, is sending out circulars in regard to it and the favor with which it is regarded by the trade. It is intimated that while it has been on the market for nearly two years no special effort has been made to sell it, but that now its sale is to be pushed, and with a view to getting it into the market as rapidly as possible an important reduction has been made in its price. Circulars relating to it are furnished those who desire to take hold of it.

The Peters Cartridge Company, Cincinnati, Ohio, are attracting attention elsewhere in this issue to an improvement in their Loaded Cartridges. In place of one Wad to perform the duty of retaining the charge after loading two are inserted, thereby assisting to confine the gases caused by the combustion of the powder and developing the full force of the charge. These Wads are lubricated by the company's special formula, and it is claimed that the Gun is thereby kept cleaner than by the use of their previous Wad.

The following announcement of a change in the firm of Dunlavy & Roe, Abilene, Kan., which is made in a local journal, indicates the esteem in which the members of the firm and those connected with it are regarded in their community:

The well-known and extensive Hardware firm of Dunlavy & Roe yesterday dissolved partnership, Mr. Roe retiring from the business and Mr. Dunlavy continuing under the name of John Dunlavy & Co. During the time he has been engaged in business in Abilene, Mr. Roe has made many friends, who will be sorry to hear of his retiring from the business, but who will unite in wishing him success in any new venture he may determine to make. The head of the firm as it now remains is John Dunlavy, a man of eminent business qualifications, who

has been successful in every business undertaking. Mr. Dunlavy has associated with him as general manager and salesman one who is well and favorably known to every citizen of Dickinson County, the veteran Hardware merchant, W. H. H. Bonebrake. Mr. Bonebrake came to Abilene in 1871, and has ever since been identified with the business interests of our city. He will do his part of the work with his old-time geniality, and win many customers to the establishment. Carl Potter, the man of small stature but giant mind, it goes without saying, will be retained to manage the books of the firm. Because of the thorough business qualifications and genial dispositions of the men who constitute the firm of John Dunlavy & Co., we predict for it a future of unexampled prosperity.

Frasse & Co., 92 Park Row, New York, issue a circular calling attention to the U. S. Hack Saw Blades, to the quality and merits of which they allude. The advantages claimed for the Blades are explained.

The Chicago Spring Butt Company, Lake and Union streets, Chicago, have recently made a successful attempt to open up an export trade in their specialties. On the 9th of June they sent a representative to the leading cities of Great Britain and Ireland, who returned to Chicago on the 10th of August with a record of sales made covering 25 tons of Spring Hinges. The points in which he sold goods comprise Cork, Dublin, Belfast, Glasgow, Edinburgh, Liverpool, Leeds and Sheffield. He further made arrangements with Moser & Sons, of London, and Hammacher & Delnies, of Hamburg, to act as distributing and sales agents for the company. They will carry a full line of the company's Spring Butts, which they buy, and will thus sell from stock.

The Competition in Ciphers.

The offer made in our issue August 23, of a prize for the largest list of ciphers for marking goods, on the terms and conditions named, has been received by the trade with much interest. It is evident that the competition will be animated and attended with some interesting developments. Among the replies to the problem given in that issue as to the druggist's cipher, we have the following which describes the manner in which our correspondent approached it:

I started very grandly, thinking it would be a simple matter to solve the enigma algebraically. Although the operation was not very successful, it may be of interest to outline it, in the hope that it will suggest to some others a rule that may be applicable to all such cases. As an illustration take the first item (nail brushes), and we have $12e$ equal rpl ; but of course the letters rpl do not mean that their numerical equivalents multiplied together are equal to $12e$. Expressed algebraically the equation would be as follows: $12e = 100r + 10p + l$. As the letters represent units, tens, and hundreds, in the same way the second equation would be: $12a = 10b + o$. It is needless to go through the full list, as I think this will explain the method I intended to follow. If the druggist had given four more items it would have been easy work to reach the answer, for in that case we would have had 10 equations of 10 unknown quantities, and it would have been only a matter of a little patience to solve for each letter. In the case presented there are 10 unknown quantities, but only 6 equations, and while it might be possible to solve even under these conditions by making use of the substitution and comparison methods, I for my part did not have energy enough to pursue the inquiry far enough to determine. The solution I finally reached was more the result of guesswork than anything else. As each single letter must necessarily be less than 10, 9 will be the only one which when multiplied by 12 will give a product of three

places. It is evident, therefore, that e represents the figure 9 and $rpl = 108$. Another help will be gained from the birdseed and the soap items. In the former case $12f = 10f + a$, or $f = \frac{1}{2}a$, and similarly in the case of soap $i = \frac{1}{2}l$. Both f and i , therefore, must be some number under 5, because, as those equations show, they are half of single units. One or naught they cannot be, because those were already used; therefore they must be either 2, 3 or 4. With this much data, the solution of the remainder was comparatively easy. It is obvious that the word is profitable.

Having relieved my mind of this problem, it occurs to me that possibly you might wish to print one which I have gotten up, and which I believe will not be so easily soluble. Realizing that if 12 times a single number gives a product of three places, the number must be 9, I have carefully refrained from giving any such assistance in the problem below. This problem we will suppose was a'so the work of a druggist, and it so happened that he took the same items, but, being a rather eccentric genius, he priced his goods by the one-half dozen instead of the dozen. I cannot vouch, furthermore, for the approximate correctness of his figures, for, having the answer at hand, it appears to me that his prices are hardly in accord with current market quotations. However, any more preface is unnecessary, so here is the statement in tabular form:

	Each.	Per half dozen.
Nail brushes.....	r	lt
Tooth brushes.....	w	am
Bird seed, packages.....	a	ek
Soap, cakes.....	s	wl
Cologne, bottles.....	ol	akl
Manicure cases.....	tac	eakc

Trade Topics.

A Kansas Hardwareman, writing in regard to the case and cartage question says:

On this question of case and cartage there is no question but that the retail trade would be glad to have these charges abolished. While they would still indirectly pay about the same as they do at present they would know more accurately what their goods cost them. It is notorious that manufacturers in some lines charge twice as much for cases and drayage as variable as case charges. To most dealers outside of the larger jobbing points the case is net loss. These charges for case and cartage are something we never grumble over, but if some houses that we deal with charge us two prices on them we squeeze out a little lower figure from them than from others or let them go. We know of a party who was charged 75 cents or \$1 for a couple of soap boxes ten years ago, and he has never bought a cent's worth of the house since, they refusing to make any rebate when their attention was called to the matter. While we would be very glad to see these charges done away with, we are not very sanguine of this result, as we believe it is a source of revenue for many manufacturers and all jobbers, and we do not think that complaints from their customers are frequent enough to make them consider a change desirable.

From a Michigan Hardwareman we have the following relating to the same question. On his letter-head the following form of order is printed:

Gents: Please ship via R. R. (F. O. B.) Send R. R. contract and draw at sight, 30 days from date of bill, through Home National Bank, without exchange or protest. Cancel all orders for goods not sent with first shipment.

Concerning which our correspondent adds:

I have used the above order for the last 23 years and have no trouble with boxes, cartage, &c. If Iowa Hardware firm adopt the same form they will have but little to charge back.

Concerning the recent course of the market in Wire Nails a correspondent writes as follows:

In conversation with the different manufacturers I hear how certain firms are ruining trade by cutting prices so low that no one can do business, except at a loss, and that many are thus doing business is not to be doubted, but any one who has given the matter any thought can readily see that the present depression is solely the result of natural consequences. We are selling Wire Nails in direct competition

It contains 24 drawers, 9 x 14 inches, running through and divided in the center. They can be drawn out from either side. The front half of drawers is filled with Curry Combs and Brushes, Seine Twine, Trout Lines and Sash Cord, and the rear with surplus stock of Pocket Cutlery, Shears, Stove Blacking, &c. On the

bins holding about 100 pounds each. On this counter is a Westphal Bolt Case. The Stove platform shown in the diagram, Fig. 262, is 24 feet long, 3½ feet wide and 6 inches high and is occupied by Ranges. The Cook and Heating Stoves occupy the remainder of the floor space, as indicated. The office is 7 x 12 feet and is located

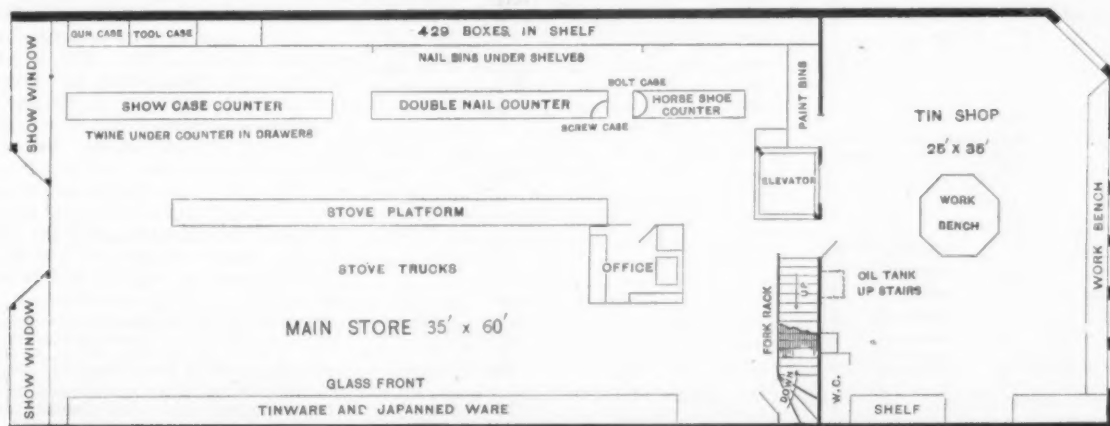


Fig. 262.—Store of E. R. Strong, Fort Atkinson, Wis.

with Cut Nails, and on their comparative values must depend the price. As long as the statements so extensively made by Wire Nail manufacturers that Wire Nails contained 50 per cent. more to the pound, and held more than Cut Nails, were not doubted, they readily commanded a corresponding advance in price. But now that Cut Nail manufacturers have proved and extensively advertised the fact that as regards holding qualities the very reverse is true, and that Wire Nails count out less Nails to the pound than advertised, it is certainly very natural that the price should be affected. We believe that Wire Nails can be so improved as to hold more than Cut Nails, but, unless this is done, and done universally, there is more chance of a further decline than an advance in price, which all are anxiously awaiting.

The following inquiry from a Pennsylvania Hardware house explains itself:

What is the reason some of the surplus capital of America is not invested in a solid wrought-steel face or solid steel Anvil factory? You certainly know that there is not a first-class Anvil of European manufacture on the market. The Wright and the Wilkinson Anvils all cushion on the face, crumble on the edges, or the steel plating parts from the body of the Anvil. It is foolish for American manufacturers to persist in ignoring these facts. We want a first-class article made at home, and made at once, and no article of like importance offers such certain and large profit for the same investment. The writer has had 15 years' experience in selling Anvils to the blacksmiths of Western Pennsylvania and Eastern Ohio, and makes no wild statement in saying that he could sell a properly made domestic article to every blacksmith in the United States needing such a tool as against anything imported from Europe. Give this some attention, as our neglect in this matter is unbecoming an inventive, progressive and wealthy people.

Arrangement of Stores.

We give below a diagram of the store of E. R. Strong, Fort Atkinson, Wis., and also a description of some of the special features of his arrangement. It will be observed that the tin shop is in the rear of the store, and that some attention is paid to its fittings. Regarding his store, Fig. 262, which was erected in 1887, and is exceptionally complete in its arrangement, Mr. Strong writes:

My store has a frontage of 35 feet, with an 8-foot entrance. The depth of the building is 85 feet, 25 feet being cut off the rear end for shop. My first counter is 2 feet 4 inches in height and 15 feet long.

south wall or Hardware side the shelving is 18 inches in depth and 8 feet high, surmounted by a small cornice. Above this are two shelves 1 foot in width, on which are kept full packages and surplus stock of shelf goods. Goods on the upper shelving are reached by means of a railroad ladder running the full length of the shelving, 53 feet. The first 12 feet are divided into

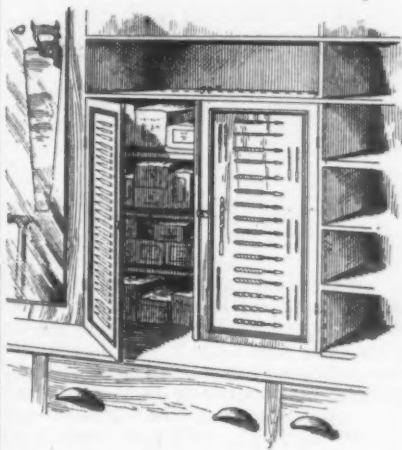


Fig. 263.—File and Bit Case.

two cases with sliding glass doors, the first for the display of Guns and the second for Carpenters' Tools. Next to the Tool case is a File and Bit case, 28 x 30 inches, with swing doors, in which are kept Files and Bits in original packages, samples being displayed on the doors, as shown in Fig. 263. Beyond this there are five sections of drawers, each 10 x 6 inches, and three sections, each drawer 8 x 6 inches, and a single row running the full length of the shelving, 15 x 7 inches. Each drawer occupies a pigeon-hole by itself, and has a flanged face to prevent its being pushed in too far. Across the shop wall and elevator side are arranged shelves for Glass and fine Carriage Paints and Varnish.

On the first counter is a high showcase for Pocket and Table Cutlery and Shears and a small counter desk, in which is kept the money drawer and cash sales book. Next comes a double Nail counter, Fig. 264, with showcase for display of Paint Brushes and miscellaneous articles. On the rear end of the Nail counter is a Westphal Screw Case. The third counter is used for Horseshoes and is divided into

12 feet forward of shop, commanding a view of the shop, as well as of the salesroom. The office is not raised from the floor, but is ceiled up to the height of 3 feet 9 inches, and above this is a wire railing 2 inches wide running around the office. The door is of wire and reaches from the floor to the top of the railing. Against the stairway wall I have 19 of J. N. Hager's Patent Fork and Shovel Brackets, of which you have already given a description. This device for keeping Steel Goods I consider one of the most valuable features of my store. The goods are always well displayed and are never in the way.

My elevator is a No. 5 Reedy Double-Drum Elevator; platform 5 x 6 feet. The guide posts and weight are on the side, and the hoisting rope in front and brake ropes in one corner, thereby giving access to the elevator either from the shop or salesroom. The elevator runs from the cellar to the second story.

Our Rope Reels are in the second story. The ends of the Rope are passed through holes in a board nailed to the side of the elevator to prevent them from unreeing too fast, and the ends are brought down within easy reach from the elevator platform on the level of main floor. The

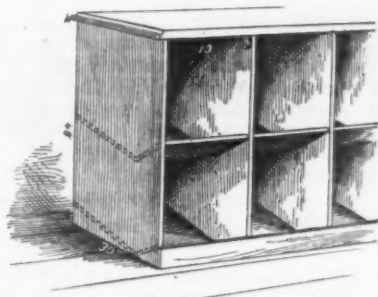


Fig. 264.—Nail Counter.

second story is used principally for storing surplus stock of Stoves, Tinware, Sheet Iron and heavy Tin Plate. In the cellar are kept nails, Barb Wire, Door Hangers, &c.

The shop is entered between the elevator and the stairway door. To the right of the door two 1½-inch gas-pipes lead down from two two-barrel tanks in the second story containing raw and boiled Oil. In the corner of the shop is a self-acting water-closet, Fig. 265 represents

cupboard for keeping Boiler and Tin Plates and Tinners' Trimmings. In the lower right-hand compartment are kept IC and IX 20 x 28 bright Tin Plate and IC and IX 20 x 28 R. T., and the smaller sizes of Tin Plate. In the double cupboard to the left Nos. 8 and 9 Tin and Copper Boiler Plates are kept, each kind having a shelf of its own. Above the Boiler Plates are kept Copper Pits of all kinds. The upper cupboard is mainly occupied by Tinners' Trimmings. By this arrangement the stock is kept in good

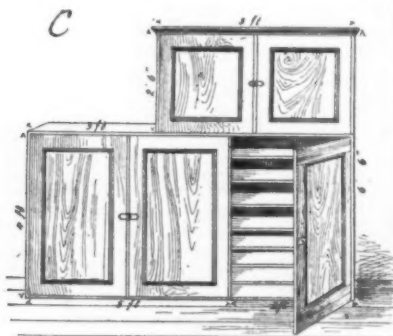


Fig. 265.—Cupboard for Tin Plates, &c.

shape. Fig. 266 shows our octagon tool bench in the center of the shop, which fully explains itself. It is 7 feet across, 33 inches high, and has shelf underneath for smaller tools. The eight sides of the bench are occupied by Tin Folder, Vise and Bench Drill, Small Groover, Roller, Double-Seamer, Stove-Pipe Swedge, Stove-Pipe Folder and Groover.

From B. H. Newell & Co., Shelburne Falls, Mass., we have a description of their Belting rack, which is shown in the accompanying illustration, Fig. 267, in connection with accommodations for other goods, as referred to below. After stating that their object in constructing this rack for Belting was to obviate the necessity of removing the roll from its compartment and requiring one clerk to hold it while another unrolled the requisite quantity of Belting, our correspondents in describing their method say:

Our rack is made of standards 3 feet square and 1 inch thick with a semi-circular piece cut from their front side extending to the center. These standards are set upon a base 3 inches high to keep

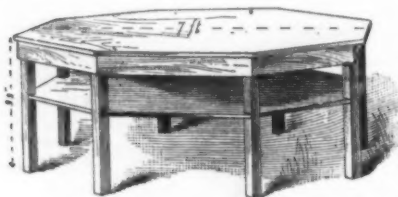


Fig. 266.—Octagon Bench.

out dust, &c., and are placed $\frac{1}{4}$ inch further apart than the width of Belt the compartment thus formed is intended to hold. To prevent warping and to assist in nailing the standards in place we had a piece of $\frac{1}{4}$ -inch board placed in the bottom and top of each compartment between the standards. In the center of the standards we attached by three screws a hook made from 1 x $\frac{1}{2}$ inch iron, bent as shown in the illustration, the hook being designed to hold a $\frac{1}{4}$ -inch bar. These hooks must be set into the face of the standard just far enough to bring the bar to the center of the compartment. We then took a piece of timber 3 $\frac{1}{2}$ inches square and cut off blocks $\frac{1}{4}$ inch shorter than the sev-

eral compartments were wide, bored a $\frac{1}{4}$ -inch hole lengthwise through the center and drove a piece of $\frac{1}{4}$ -inch machinery steel cut to the proper length (which is 1 inch longer than the blocks), allowing the steel to project through them $\frac{1}{4}$ inch from each end. The edges of the block must be beveled a trifle to prevent injury to the inner turn of the roll of belting. The blocks are then driven into the orifice in the center of the roll and the belt hung upon the hooks above described. The roll is now hung upon its center like a grindstone, can be easily drawn out and as easily rolled up again, without taking it from its place. Our store is 65 feet in length, and the rack, being placed in the rear, gives ample space for unrolling and measuring the belt. Marks along our counter enable us to draw out about the required length; but for measuring we have found no better way than to use a reliable tape.

By this arrangement each roll is independent of the other, can be removed or replaced in its compartment very easily by using a bar, requires only one clerk to unroll and reroll the belt and shows up the goods to the best advantage. We find the top of the rack to be an excellent place for keeping heavy goods, such as Stone Hammers, Babbitt Metal, Bolt Ends, &c., and

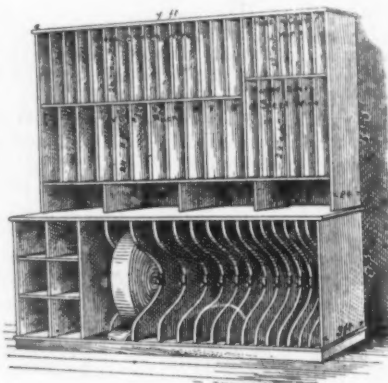


Fig. 267.—B. H. Newell & Co.'s Belt and Wire Rack.

we have utilized the space above by building a rack for retail stock of Iron, Steel, Brass and Copper Wire in coils, as shown in the cut. This rack is designed to accommodate our entire retail stock of Wire, bringing together in one place easy of access and displaying the goods very satisfactorily. Too often we find Wire stowed in out of the way corners, hung on pegs to serve as roosts for flies during the summer months, while the sizes are often mixed, taxing the patience of both the merchant and his customer when the article is called for. The top of the rack is used for extra stock of Tire Bolts, Screws, &c. At the left of the space assigned to Belting we have made tills or boxes, which, being 3 feet deep, will accommodate the longest Axe or Pick Handles.

Referring to general features in the arrangement of their store the same house give us the following information, alluding, it will be observed, to the question which has so frequently recurred, as to whether goods should be kept in the original packages or in wooden boxes:

Our shelving is supported by iron brackets instead of wooden standards. This is more satisfactory to us, for we can use all necessary space in displaying a line of goods without encroaching upon a space which the line will only partly fill. It also economizes room.

We keep our shelf goods in original packages as far as possible, and this at present means nearly our whole line, for

goods are now largely put up in convenient boxes strong enough to sample on the outside. We are afflicted with the old foggy notion that in our line a better display can be made with goods than with shelving, and therefore we use our top shelf for storing back stock, making it serve as a fancy cornice, instead of investing hard cash in a wooden one.

The Stove Trade Outlook.

A few weeks since we presented in these columns an extract from *The Metal Worker* upon the trade outlook for the near future directing attention to the importance of all manufacturers being of one mind on the subject of maintaining prices. The question is one of such obvious interest to the whole stove trade as to warrant the president of the National Association of Stove Manufacturers in addressing the members of that body through the medium of a circular letter, a copy of which we take pleasure in presenting herewith:

THE NATIONAL ASSOCIATION OF STOVE MANUFACTURERS. PRESIDENT'S OFFICE. DETROIT, MICH., August 30, 1888.

To the Members of the National Association of Stove Manufacturers.—DEAR SIR: It is with no small degree of pleasure that I feel able to congratulate you on having so well sustained the prices of your productions, especially as the volume of this year's trade has so far been a disappointment to many.

The present indications are that there will be a large demand for stoves before the close of the season, and that, on the whole, the year's business will reach its normal volume. The crop reports are especially encouraging, the total production of grain being estimated at not less than 2,000,000,000 bushels. Business throughout the country is reported fair; money circulates well, and the probability is that the demand for our goods will yet be such as will be sufficient to prevent any overstock at the end of the year. Under these conditions, there being no necessity for uneasiness through delay in marketing stoves, I recommend each manufacturer to act firmly and consistently in the maintenance of at least present prices, knowing that they are not excessive, and are such as will afford him only a fair profit for the services he renders to the public in supplying it with so necessary an article as the stove. A little impatience, a little precipitation now, may affect the market disastrously and produce results that all would deplore. I therefore urge you to maintain your prices firmly and not to allow yourselves to be influenced by hearsay statements of concessions made by competitors. It is of importance to hold the market steady. There is nothing to warrant a reduction. It is true that pig iron is a little lower than it was last year, but very little—not so much so as to effect any appreciable reduction in our cost, and the decrease is more than offset by advances in other items which necessarily enter into our productive expenses. All other articles are at least as high as they were, and certainly wages are fully up to last year's standard. Stoves cannot be made cheaper in 1888 than they could in 1887. I am desirous of corresponding with each and every manufacturer of stoves, whether a member of our National Association or not, and of receiving any suggestions on subjects connected with our trade. I shall feel under obligations to those who will favor me with their views, especially to those who interest themselves in matters connected with our association. Yours respectfully,

GEORGE H. BARBOUR, Pres't. N. A. S. M.

English Steel Sheets.—English manufacturers of steel sheets will have to send better samples of their work to this country than they are now forwarding if they hope to build up a trade here. A trial shipment, ordered some time since by a Chicago consumer, was received last week and proves to be anything but satisfactory. The sheets do not lie flat, and in many instances they are badly buckled. Some of the sheets have huge protuberances in them which look as though the sheets had been piled on stones. The surfaces are finished very roughly. In no respect do they compare at all favorably with American steel sheets of the same grade, width and gauge. The purchasers are disposed to content themselves with the result of this attempt at importing cheap foreign stock, and American manufacturers have correspondingly risen in their estimation.

Foreign Markets.

EQUIVALENTS	Cents.
Franc, Peseta or Lira.....	18.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Milreis (Portugal).....	51.08
Milreis (Brazil).....	54.6
Mark (Germany).....	23.8
Pounds.....	220.5
Kilogram.....	194.

URUGUAY.

MONTEVIDEO, July 6, 1888.—*Machinery*.—The duty on Machinery is 8% ad valorem; a decree is published admitting free for a term of 10 years all textile Machinery.—*El Comercio*.

BRAZIL.

PARA. August 31, 1888.—*India Rubber*.—August shipments have been large to England and comparatively light to America—say only 155 tons.—*Per cable direct*.

CHILI.

VALPARAISO, July 6, 1888.—*Copper*.—The entire output for July and August has been sold to arrive, sales being limited to 6236 quintals on the spot at \$28.80 @ \$29.45, the outside figure equaling \$74.11 5/8, with 27/6 freight per steamer. *Nitrate*.—Has been neglected during the fortnight, still producers have made concessions only in a few instances, and 383,500 quintals have changed hands at \$2.70 @ \$2.82 1/2, the inside figure equaling 8/23 1/2 @ cwt., with 27/6 freight. June shipments amounted to 29,000 tons to Europe and 4000 to the United States; the charters during the fortnight were 56,800 tons for the former and 900 tons for the latter. *Coal* continues stiff at 55/ @ 60/, Newcastle, on the spot, and 48/ @ 50/ for April shipment, 44/ May and 37/ June. Australian, July shipments, 37/. *Exchange*, on London, 90 days, 26d.—*Weber & Co*.

JAPAN.

YOKOHAMA, August 24, 1888.—*Petroleum*.—The arrival here of an English steamer with a cargo of Russian Petroleum from Batoum has caused a decline in the price of American Petroleum in this market.—*Per cable direct*.

EAST INDIES.

SINGAPORE, July 6, 1888.—*Tin*.—There have been sold during the week some 200 tons at \$29.75 @ \$30.50, the market closing firm at \$30.75 buyers. During the first six months there have been shipped to England 91,146 piculs, against 34,610 in 1887 and 29,213 in 1886; to the Continent respectively 7594, against 15,095 and 12,326, and to the United States 12,783, 30,869 and 14,784. *Gum Damar* has been drooping; £15 has been paid for Banjer, \$20 for Palembang and \$17.50 for Mixed, while *Gum Copal* has been selling at \$7 @ \$12. *Gutta Percha* has been in active request at \$105 for good quality red; finest at \$108 @ \$110, and inferior may be had at \$23 @ \$35. *India Rubber*.—Borneo has slightly declined; a small business has been transacted in Ordinary at \$33 @ \$34.—*Gillfillan, Wood & Co*.

SINGAPORE, August 15, 1888.—*Tin*.—There have been shipped from the Straits Settlements to the United States during the fore part of this month 150 tons, against 450 during the corresponding period of last year, and to England 500, against 1000. The total shipments since January 1 to the United States sum up 1300, against 3250, and to England 11,100, against 8000.—*Gillfillan, Wood & Co., to Charles Nordhaus, New York, per cable direct*.

MANILA, August 20, 1888.—*Hemp*.—Buyers at \$10.25 @ picul, against \$10.62 1/2 same date last year; this equals £23.15/ @ ton, cost and freight, and £25.10/ respectively. There were no clearances for the United States during the week, while last year 5000 bales cleared, and since January 1 99,000, against 138,000, leaving loading for ditto 10,000 bales against 22,000. The clearances for England since January 1 have been 230,000 bales, against 140,000; loading for do. 4000, against 6000; cleared for all other ports 47,000, against 27,000; receipts at all ports since last cable 4000, against 14,000; do., since January 1, 367,000, against 301,000 last year and 258,000 in 1886. *Freight*, \$6, against \$6. *Exchange*, 3/5, against 3/5 1/2.—*Ker & Co., to Charles Nordhaus, New York, per cable direct*.

COLOMBO, July 12, 1888.—*Plumbago*.—Has been moderately active at well sustained figures, as follows, in rupees per ton: Large lumps, 145 @ 170; Ordinary ditto, 125 @ 150; Chips, 80 @ 95, and Dust, 40 @ 65. Since October 1 the shipments to England sum up 61,676 cwt.; to Marseilles 38 cwt.; to Trieste, 523; to Hamburg, 7415; to Antwerp, 3359; to Bremen, 1012; to India, 82; and to the United States 128,329; together, 202,434, against 183,331 in 1887, 142,329 in 1886 and 155,006 in 1885.

Coir Yarn has remained unaltered at 7 @ 12 rupees @ cwt. Nos. 1 to 4. *Exchange*, six months' sight on London, 1/4 1/2.—*Volkart Bros., through their Agent, John W. Greene, 82 Wall street, New York*.

AUSTRALIA.

MELBOURNE, VICTORIA, August 9, 1888.—*Iron*.—A decline has taken place in several articles. We at present quote Galvanized Iron, £16.5/; Fence Wire, £9.10/, and Scotch Pig, £4.15/. Considering the dull season, sales have been tolerably brisk. *Tin*.—Shipments during the fortnight from the Continent and Tasmania only amounted to 150 tons.—*Per cable via Europe*.

CHINA.

SHANGHAI, July 3, 1888.—*Copper Coin*.—Copper coin, the only fractional coin in circulation, is getting scarce in China, and the Government has bought Copper for increasing the coinage; new mints have been established for the purpose. There is some curiosity existing as to whether the new coin is to have its full face value. If the coin contains nearly all Copper it is retained by the people and melted down; if too little there will be counterfeiting, and quite a number of private mints will begin to operate, at the establishment of which the Government did not take umbrance in former years.—*Chinese Herald*.

SPAIN.

BILBAO, August 11, 1888.—*Iron Ore*.—Only a few single cargoes have changed hands at 6/10 @ 7/3 Rubios, and 7/6 @ 8/ Campanil. As freights have been improving here it is likely that the number of vessels in search of cargo will soon increase in our port. Total shipments since January 1, meanwhile, sum up 2,383,372 tons, against 2,772,905 last year. *Pig Iron*.—There were exported during the week 2605 tons and shipped coastwise 600. We quote, spot, 57 @ 60 pesetas; futures, 55 @ 58, and Lingotillo, at Huelva or Seville, 65.—*Bilbao Maritimo y Comercial*.

GERMANY.

HAMBURG, August 25, 1888.—*Iron*.—Our Dortmund correspondent writes as follows: The increase in the stock of Pig Iron in Rhenish-Westphalia for the month of July has only been 8200 tons. Spiegel has been taken for American account to the extent of 10,000 tons, 20 @ cent., which will keep busy four of our largest blast furnaces for six weeks to come. The price submitted to make the sale has been an exceedingly low one. Ten to 12% cannot be quoted any higher than 54 marks @ ton in the open market. The Siegen rolling mills have, by this sale, been induced to buy their Forge Pig, getting it 3 marks cheaper than Rhenish-Westphalia was prepared to sell them. Bessemer has been rather dragging; Luxembourg Forge Pig is now fetching 40.30 marks; English Bessemer, 43/6. Merchant Iron has been slightly looking up both for home use and for export. Some rolling mills sold all the way into the fourth quarter. Specifications are also coming in more readily; makers are thus kept very busy, and the entire situation is an improved one; only hoop manufacturers stand in need of an export trade for the moment. Boiler Plates continue in brisk demand, thin sheets remain neglected. Wire Nail manufacturers are busier now at a decline of 1 @ 2 marks; Wire Rods are so low that to trade them would be attended with downright loss. Foundries, machine and car shops are all profitably engaged. Railroad material is moderately active.—*Borsenhalle*.

Steam car heaters will be in use on many important lines of railroad the coming winter. The entire Vanderbilt through passenger service will be equipped with engine steam heaters and the car stove abandoned. On the New York Central of its 900 passenger coaches all but about 50 are now equipped with the new heaters. The Boston and Albany is similarly equipped. For the present only the Lake Shore through trains will be provided with this new device. The Michigan Central and the Nickel Plate trains also will be equipped with steam heaters. The cost of fitting out coaches with these heaters is about \$200 each, and the expense of adapting the engines to this new service approximates the same figure. The draft upon the engine's steam is not noticeable.

The Ohio Falls Iron Works, New Albany, Ind., made an excellent run during August, not losing one day in the month. In sympathy with the trade, they have ad-

vanced prices on several sizes that were cut too low by competitors. The outlook for their fall season is good, with plenty of orders ahead.

Natural Gas Charges.—An interesting suit, the result of which will possibly determine the question as to the right of a natural gas company to charge one consumer more than another for fuel was commenced in the courts at Pittsburgh last week. The suit in question is that of the Farady Carbon Company, of that city, against the Philadelphia Natural Gas Company, for \$160.70, claimed to be overcharges for natural gas consumed by the plaintiffs. The works of the company are located in the Fifteenth Ward, in Pittsburgh, and they allege that when they negotiated with the Philadelphia Company for natural gas, which was necessary to the manufacture of their specialty, carbon points for electric lights, the agent of the company would not furnish them gas at a less rate than 85 cents per 1000 carbon points manufactured, equal to a rate of 16 cents per 1000 cubic feet of gas consumed. The plaintiffs further allege that the Philadelphia Company, by reason of illegal arrangements with other natural gas companies, were able to compel them to accept this rate under the threat that if they refused to pay it the gas supply would be shut off. During the month of July the plaintiffs manufactured 271,237 carbon points and for that month were compelled to pay defendants \$230. They claim that this price is exorbitant and greatly in excess of the rate charged other consumers, and that another factory which adjoins theirs pays 5 cents per 1000 cubic feet. They ask that the defendants be compelled to return the \$160.70 overcharged and that they also be compelled as public carriers to furnish them gas at the same rate as other consumers are charged. The outcome of the suit will be awaited with considerable interest, not only by the consumers of natural gas, but by the producers as well.

Pittsburgh Freights.—A meeting of the Pittsburgh committee of freight agents was held in that city last week to arrange the new rates from Pittsburgh to Mississippi River points, which go into effect on Monday, the 17th inst. The rates apply to points north of St. Louis, not including the latter city, and no change has been made to places that take a less rate than the Peoria rate. From Pittsburgh to Davenport, Burlington, Dubuque and Keokuk the new rates will be as follows: First-class, 66; second, 58 1/2; third, 44 1/2; fourth, 32 1/2; fifth, 28; sixth, 23 1/2; iron, in less than carloads, 24 1/2; in carloads, 19 1/2; to Quincy, 62, 54 1/2, 40, 29, 25 1/2, 21 1/2; iron, less than carloads, 24 1/2; carloads, 18; to Hannibal, 66, 59, 45, 33, 28, 23 1/2; iron, in carloads, 20; less than carloads, 24 1/2.

The new Chicago, Burlington and Quincy steel railroad bridge at Nebraska City, Neb., was formally opened on Thursday. The bridge cost \$1,500,000.

The railroad companies have given notice of an advance in freights on the 15th inst. on old rails and scrap iron between Chicago and Eastern points. The rate per ton to Cleveland will be \$2, to Youngstown \$2.25 and to Pittsburgh \$2.50. This is an increase of 40 cents to Cleveland and Youngstown and 50 cents to Pittsburgh.

Pythagoras Hall, the local headquarters of the Knights of Labor in New York, it is reported, will go into the hands of a receiver.

Tropic furnace, in the Hanging Region, started on the 30th ult.

New Corn Popper.

The Fred J. Meyers Mfg. Company, Covington, Ky., are introducing to the trade, among other seasonable specialties, a new revolving corn popper, illustrated in the accompanying engraving. The popper consists of a meshed wire cylinder 5 inches long and 13 inches in circumference, the ends being closed by metallic

adapted to hot or cold water. The cushions, it will be observed, answer a double purpose, that of serving as a packing and also preventing all water hammering. The goods are said never to leak at the stem. It is further noted that the cam which throws the stem down and opens the valve is solid, and consequently very durable. The value of these goods is attested by numerous testimonials from many Western

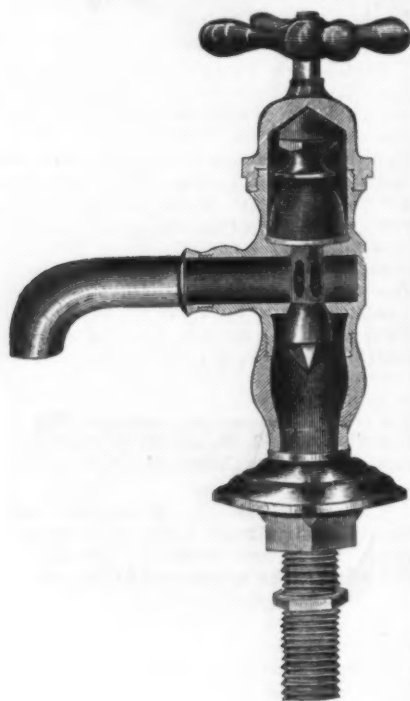


New Corn Popper.

disks through the center of which, and a bracket arm attached to a suitable handle, passes a crank-shaped rod. Attached to this crank is a long wire rod by means of which the cylinder is revolved as slowly or as rapidly as may be desired. One of the metallic disks, as shown in the illustration, is provided with a lid held in proper position by means of a small catch. The advantages claimed for the new popper are lightness, durability, and the production, by reason of the revolving motion, of more uniform results in popping corn.

The Prier Self-Closing Basin Cock.

The accompanying cut shows a sectional view of the Prier Self-Closing Basin Cock, manufactured by T. Wortley & Co., of Kansas City, for whom Frank M. Potter, 87 Howard street, Newark, N. J., is the general agent for the Middle States. A special feature of these faucets is that they



The Prier Self-Closing Basin Cock.

close with the pressure, which is held to be the only correct principle. The goods have no metal springs to relax, open easily against any pressure, and it is said always close positively even without pressure. The spout of the faucet is so constructed that no water will remain in the body of it when closed. The cushions and valves are made of the best quality of rubber and

users. We are informed that the manufacturers have just placed an order from the Pullman Palace Car Company for over \$6000 worth, and we understand that they are to put them in all their cars. The faucets are made in all ordinary forms and shapes required in plumbing work.

Self Extinguishment of Fires.

A correspondent of *Engineering*, writing under the above head in a recent issue, says: There are numerous instances where fires have been extinguished through causes connected with their origin, and so completely outside of precedents that they serve as instances of the happening of the unexpected. In this connection we do not refer to the fires extinguished by automatic sprinklers, where the result is clearly what has been expected to happen. Notwithstanding the fact that when a fire occurs on property protected by automatic sprinklers, those present avail themselves of all the means of grace in the shape of the usual fire apparatus at hand, yet there are numerous instances where fires have occurred at night or in rooms vacant at the time, where the fact has been made known only by water percolating through the floors, or the sound of the automatic fire alarms, or from the sprinklers which have already come into active operation, the fire having called down means for self extinguishment. But the instances which we have in mind are those where the means of extinguishment were not expected, as in the well-known cathedral building in Boston, where a fire, caused by spontaneous ignition in a storeroom, melted the lead water-pipes, and the water issuing from them extinguished the fire. A similar instance happened in a building in Market street, Philadelphia. Some sheet mill pails were returned by the purchaser to a tinsmith in Chester, Pa., with the complaint that they were not tightly made. The manufacturer resoldered them, and in order to test his work filled them with water and hung them upon hooks at the ceiling. While the men were at dinner during the noon hour, a fire heated the upper part of the room so that the bails connecting the handles to the pails became unsoldered, and the dropping of the pails of water dashed out the fire. Some waste left upon the top of a steam pump at Watertown, Mass., blazed from spontaneous ignition, and this in turn set fire to the lagging around the steam cylinders and the feed-pipe, where it melted the soldered attachments of a continuous automatic oiler. The steam from the feed-pipe was discharged through the small tubes formerly leading to the oiler, and extinguished the fire. There have been numerous instances of fires which have ceased for want of air. During the war of the rebellion attempts were made to burn New York City, as the

result of a conspiracy fires being started in several hotels; but in order to prevent premature detection the culprits closed up the rooms so tightly that the fires were smothered. At a hotel in Woonsocket the steam pipes caused a fire in the spaces in the walls of the building, which was extinguished for want of air to support combustion. The time of the fire is unknown, as its occurrence was not discovered until some time afterward, when in the progress of an alteration to the building the facts were made apparent. It may be interesting to know that in this instance the steam-heating service was ordinarily used at a pressure of about 4 pounds to the square inch during the coldest weather, and that the safety valve was so arranged that the pressure could never exceed 10 pounds. A spark of static electricity proceeding from a belt ignited leaking gas, and this in turn set cotton on fire, which operated the automatic sprinklers and extinguished it. An attempt was made to destroy a block of new dwellings at Brooklyn, Mass., before the buildings were entirely finished. Some people, alarmed by the smoke which was seen in each division of the structure, rushed in to save doors and portable fixtures, when it was noticed that the fires did not appear to gain any headway, and when the smoke had entirely died away it was found that the incendiary had placed lighted candles in sawdust and other inflammable material in drawers and closets, but with such limited supplies of air that combustion could not be supported and the fires became smothered.

Circus Bank.

The Shepard Hardware Company, Buffalo, N. Y., are putting on the market a new toy bank, which is named the Circus. It is represented in the accompanying illustration, from which it will be inferred that it is operated by a crank, which causes the revolution of the ring with the pony and clown. The penny is placed on the bracket in such a position that the hand of the clown strikes it and causes it to fall into the bank. In connection with



Circus Bank.

the mechanism for revolving the pony there are contrivances causing the pony to kick up, the wheels to turn and the clown's arms to move up and down, making an amusing toy. The money is removed from the bank by means of a locked opening, for which a key is furnished. The dimensions of the Circus Bank are as follows: Height, 4½ inches; length, 8½ inches; width, 7 inches. It is made wholly of iron and highly polished in brilliant colors.

Interesting testimony respecting the Alaska fur seal fisheries was given before a Congressional committee in Washington last week by C. A. Williams, of New London, Conn., a member of the Alaskan Fur Seal Company, who hold a lease of the seal islands St. George and St. Paul. With an idea of presenting to the committee the actual profit derived from the seal fisheries

Mr. Williams presented a table showing that during the 16 years from 1872 to 1887 there were reshipped from London to New York dyed seal skins amounting to 825,000. The skins were sold in London in the spring and the fall of the year at market prices, and were not kept on hand to secure good prices. On these reshipments the Government collected a customs duty of \$3,123,783, or an average of \$195,236 yearly. This, added to the leased tax of

as a large counter show case. The wooden framework of this revolving case is covered with plush, and two glass doors inclose it, permitting easy inspection of the contents while preserving them from dust and the injurious action of the atmosphere. The cutlery hangs in small racks against a velvet background. A brass-headed nail under each article enables a price tag to be hung in immediate connection, which obviates the necessity of marking the cutlery it-

Hull's Coffee Roaster.

At the present day, when the practice is so generally observed of housekeepers roasting their own coffee, devices for this purpose are meeting with a demand sufficient to warrant retail dealers keeping coffee roasters in stock. As the great majority of people do not care to roast more than a pound or two at a time, small capacity roasters are preferred to the

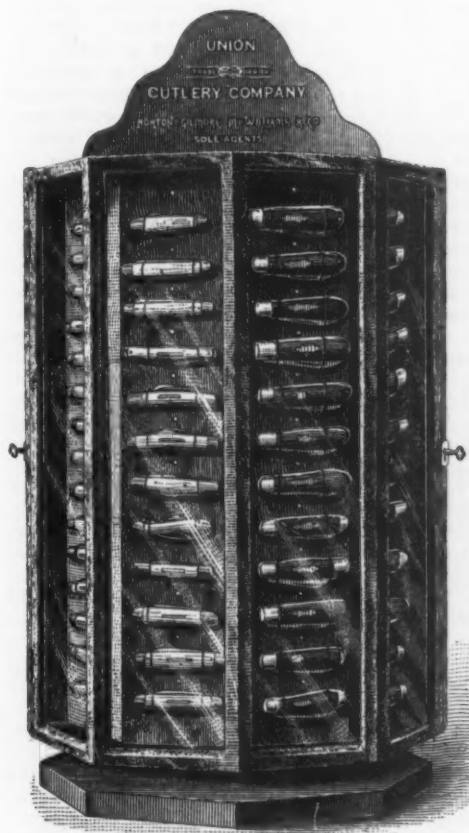


Fig. 1.—Cutlery Case, General View.

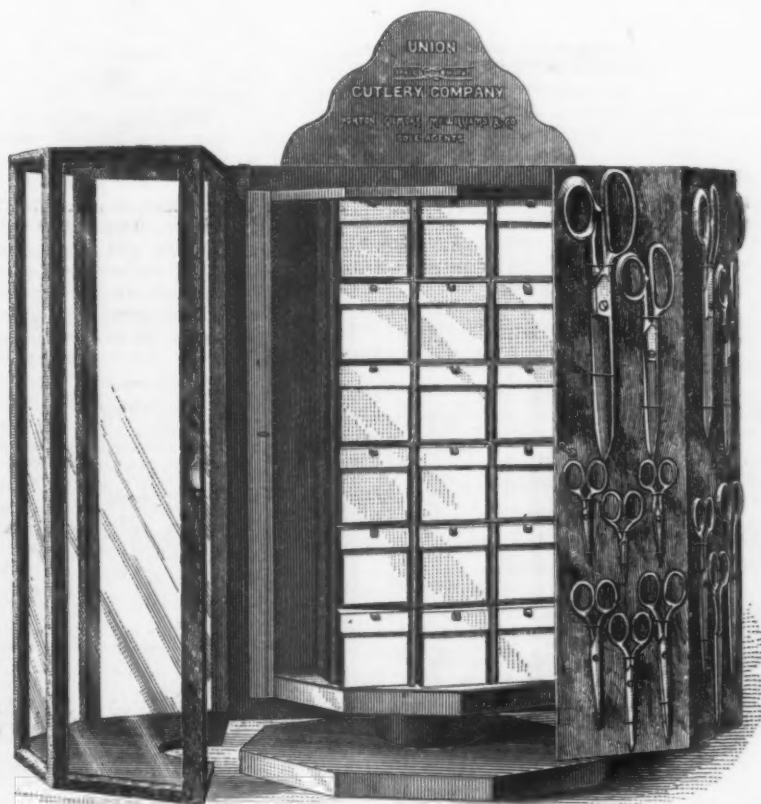


Fig. 2.—Cutlery Case, Showing Interior.

\$55,000 per year and the additional tax imposed of \$2.62½ on each skin taken, raised the annual sum realized by the Government to \$512,736. In the whole time the company had the privilege of taking seals the company had paid over \$8,000,000 to the Government, or a sum exceeding by over \$1,000,000 the price paid by the Government for the whole of Alaska, with the seal islands included. Mr. Williams said the company would prefer that the Government lease the privilege of taking the seals, because the prestige of the Government served as a protection from hostile parties and marauding seamen. The season's catch, just arrived at San Francisco, comprises 100,000 skins, valued at \$2,000,000.

The Union Cutlery Company's Show Case.

The Union Cutlery Company, controlled by Horton, Gilmore, McWilliams & Co., of Chicago, have gotten up a line of show cases which they furnish free to cutlery and jewelry purchasers when their orders cover a certain amount. So unique are these cases, and so admirably are they adapted to the purpose of displaying goods of this character, that we present herewith illustrations showing their design and interior construction. The case selected for illustration is hexagonal in shape, stands 2½ feet high, requires but a foot square of space on a counter, is made to revolve at a touch of the hand, and will hold as large a quantity of pocket knives, scissors, &c.,

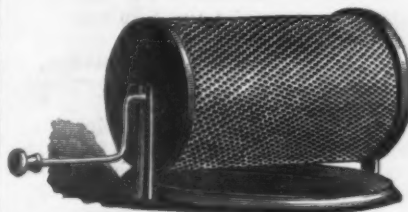
self, to its injury. One of the illustrations shows the case closed and the other shows it open, disclosing pigeon holes in the interior of sufficient capacity to carry a stock of 36 dozen pen and jack knives and 15 dozen scissors and shears. The inside doors of the case are fastened with neat brass hooks, but the outside glass doors have handsome locks. These cases are intended to stand on counters, and they form not only a very convenient receptacle for goods but also a most attractive ornament to a store. Special cases are made for jewelry. They are of somewhat similar design but of smaller size. The chain cases hold two dozen watch chains. The frames are covered with plush and the inside is lined with velvet, forming a very effective background for the chains.

A Canadian commission is at Buenos Ayres, investigating Argentine commerce, and, as the Canadian Government has voted a subsidy for a steamship line direct to Buenos Ayres, it is thought the two countries can do some trading.

Heat, Light and Power, of Philadelphia, well known as the progressive representative of the gas industries, announces that it has become a weekly journal. Mr. George W. Graeff, Jr., continues as managing editor.

According to the *Electrical Engineer*, Mr. E. Blass, a German scientist, has used an incandescent lamp for actual inspection of the inside of boilers under steam.

larger ones. In order to meet what appears to be a well-defined demand, Mr. M. L. Hull, of Cleveland, Ohio, has brought out a coffee roaster of 1 pound capacity, a general view of which is shown in the accompanying illustration. It consists of a cylinder of perforated metal supported by two standards having a stove lid as a base. The cylinder is turned by means of a crank clearly shown in the cut,

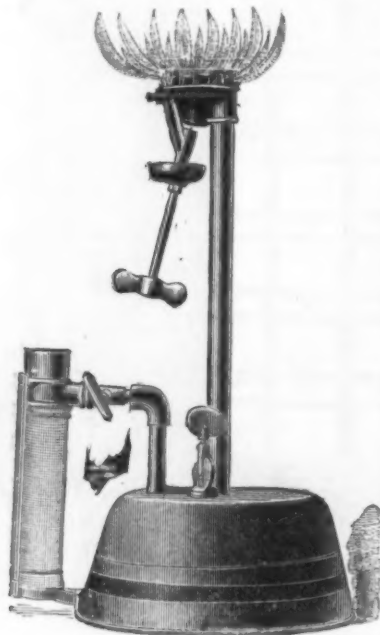


Hull's Coffee Roaster.

and it is claimed that coffee can be roasted in from 15 to 20 minutes. It is designed for use on gasoline stoves, but will work with equal satisfaction on coal or wood-burning constructions. The perforations are small, yet of sufficient size to enable the operator to see the coffee as it is roasting. When the coffee is thoroughly roasted it may be allowed to remain in the roaster while cooling, or it may be turned out, as preferred. The roaster shown above has a capacity of 1 pound.

Plumbers' Torch.

A very convenient torch for bench use of any kind, as well as for plumbers, is being offered the trade by M. L. Hull, of No. 50 Long street, Cleveland, Ohio. A very good idea of its general arrangement and construction may be gained from an inspection of the engraving presented herewith. It is shown arranged for using gasoline as a fuel, although it can be supplied with a coal oil torch burner if desired. The handle is hollow, and furnishes the air to the burner. It is only necessary to compress the handle a few times to maintain a steady, bright light. The manufacturer claims that this torch is especially adapted for plumbers' use in working in dark corners where it is difficult to secure a good light. It is also designed for use by railroad men about freight yards, for inspection of car wheels and other work



Hull's Plumbers' and Bench Torch.

about railroad stations. The broad, flat base of the gasoline reservoir forms a good foundation, and adapts it for bench use of almost any description. It is well built, compact, and is offered the trade at a reasonable figure.

The Merchant Steel Association.

The regular monthly meeting of the Merchant Steel Association of the United States, composed of the open-hearth and crucible steel manufacturers, was held in the Monongahela House, Pittsburgh, on Wednesday, the 29th ult. There was a very fair attendance, considerably more than half of the members being represented. The different reports were read, and a general discussion on the condition of the trade took place. It was admitted that the steel trade was in very satisfactory condition, with good prospects for the future. The extras adopted at the meeting held on June 1, last, and published in a subsequent issue of *The Iron Age*, were reaffirmed. No other business was transacted. The next meeting of the association will be held at the call of the secretary.

Southern Pig Iron Rates.—The Queen and Crescent Route, via the Alabama Great Southern and the Cincinnati Southern Railways, has issued a supplement to tariff No. 7, giving new rates on pig iron to Burlington and Davenport, Iowa, and Moline and Rock Island, Ill. The rate to these points from Chattanooga, Rising

Fawn, Florence and Sheffield is \$4.75. From Dayton and Rockwood it is \$4.55. The rate from Attalla, Bessemer, Birmingham, Gadsden and Wheeling, Ala., to Burlington, Iowa, is \$5, and to Davenport, Moline and Rock Island, Ill., \$5.02.

The Columbia Rolling Mill.

Last month the Columbia Rolling Mill Company opened their new works on the corner of Fourteenth street and Jersey avenue, Jersey City, N. J. The Columbia Rolling Mill Company were organized under the laws of the State of New Jersey. The capital stock of the company amounts to \$500,000 and is divided as follows: Common stock, \$400,000; preferred stock, \$100,000. There are 100,000 shares at a value of \$5 per share, which is fully paid and unassessable. The following gentlemen are the officers and directors: Jesse Larrabee, president, who is also a director of the Pennsylvania and Slatington Railroad; Weeks W. Culver, vice-president, who is also treasurer of the Barnegat and Long Beach Improvement Company, of New York; John M. Guiteau, ex-Judge Advocate of the U. S. Navy; Silas B. Dutcher, president of the Union Dime Savings Bank, of New York, and W. L. Brockaway, directors; W. A. Crawford, secretary; R. I. Powell, treasurer, and W. L. Brockaway, general manager. The company, succeeding to an established business of over five years' growth, were organized for the purpose of utilizing and manufacturing from waste material, which can be gathered in all large cities, what is called taggers iron, taggers tin and ferro-type plates.

The new buildings of the rolling company occupy six lots of ground. There are four buildings used in the business. They are 75 x 100, 50 x 100, 20 x 25, 30 x 25. This same company has been in successful operation on Goerick street, New York, for a long time. Owing to the increase in their business they moved to Jersey City in order to have more room. They will employ a force of about 100 men when they get in complete working order. Two 75 horse-power boilers will be put in the building and two 50 horse-power engines, besides four chilled-iron rolls.

The process employed for producing a valuable product from waste material of this character is very simple, consisting essentially in heating the material from three to five minutes, which has the effect of burning off all extraneous material and rendering it suitable for further treatment. In the bottom of each of these heating furnaces is a small hole, which allows the solder or lead to run into a receiving basin. About 200 pounds of lead is thus obtained from a ton of waste material. This lead is sold at a price not exceeding 16 cents a pound. But it is now proposed by the company to manufacture this tin into what is called putty powder. This will then bring a price of about 90 cents a pound. This putty powder is principally used for polishing marble.

After the waste material has been taken from the furnace and allowed to cool, the scrap is sorted, the smaller pieces being thrown out and used for other purposes, such as lids for blacking boxes, &c. The sheet metal is now passed under a rubber coated roll, which flattens it out, the rubber being used so that the sheets are not hardened, which would require them to be annealed. The metal, in packs containing several sheets each, is next passed between chilled iron rolls, which reduce the thickness. They are then annealed and repassed through the same rolls and trimmed up to the finished size, after which they are given their final annealing, when they are sorted and ready for shipment. The taggers iron, as thus produced, may now be further finished by being japanned, tinned,

galvanized or otherwise treated, depending upon the use for which it is designed to be put.

Adding to the Water Supply of Chicago.

Preparations for the launching on Lake Michigan of the caisson for the new crib, which will add to the water supply of Chicago, are being actively pushed. Two hundred and fifty tons of steel were used in the construction of the caisson. It is a double steel shell, 54 feet in height, the outer shell being 75 feet and the inner one 31 feet in diameter. The caisson will rest on four scows. It will be towed 2½ miles out in the lake, when the work of sinking it will begin.

The engineer thinks that it will settle at least 3 feet on account of its weight. However, the space between the inner and outer shell will be filled and packed with sand. Then by means of chains, hydraulic power and hoisting engines, the caisson will be lifted off the scows and lowered into the water. Four series of soundings have been made and have proved successful. When the caisson will have reached the ground two divers with hose and nozzles of great power will walk around the structure and tear up the ground so that there will be no difficulty in its sinking. If this does not prove successful the crib will be loaded down with rock. The place selected for the sinking of the shaft is considered by the engineers the safest. The depth of the lake at this point is 42 feet. This will leave the caisson about 9 feet above the level of the water. The shaft will be sunk inside the caisson, commencing from the top and building downward. The shaft will be 10 feet wide. On either side of the shaft in the crib will be three floors. The upper one will be of cast iron. Apartments will be fitted up on the first floor for the laborers, who will remain there during the winter months. The second and third floors will be used as storage rooms for hoisting and hydraulic machinery. It is also the intention of the contractors to have a dynamo on one of the floors in order to light the shaft and apartments by electric light. Four crews of 50 men will be quartered in the caisson. The contractor will have a tug commissioned to run between the shore and the crib, making two trips by day and the same at night. The shaft sunk inside the caisson will form an inlet for the lake water, which will flow through it into a tunnel connecting with the pumping machinery on the shore, by means of which the water will be distributed throughout the city.

Another very fine swing bridge has just been completed at Chicago. It was built by the Keystone Bridge Company and crosses the Chicago River at Jackson street. The turntable of this bridge is built on the side of the river channel, and the bridge is long enough to swing over a number of railroad tracks running alongside. It is built of steel, and is 280 feet long, 59 feet wide and 36 feet high, and the footways are 7 feet wide and the roadways 16 feet. It weighs about 700 tons, and the engine about 150 tons more. The engine is 15 horse-power. The floor of the engine-house is fire-proof. The bridge moves so easily that two men could turn it by the hand-key. It cost \$131,632.67.

The Augusta National Exposition which will open at Augusta, Ga., on October 10 and close on November 17, will be the largest that the South has ever held. Preparations for it are now being vigorously carried out and give promise of a successful issue.

SEPTEMBER 5, 1888.

Climax Steel Anti-Friction... dis 50 1/2
Zenith for Wood Track... dis 55 1/2
Reed's Steel Arm... dis 50 1/2
Challenge, Barn Door... dis 50 1/2
Sterling Improved Anti-Friction... dis 50 1/2
Victor, No. 1, 1 1/2; No. 2, 1 1/2; No. 3, 1 1/2... dis 50 1/2
Charlton... dis 50 1/2
Kiddie's... dis 50 1/2
The Boss... dis 50 1/2
Best Anti-Friction... dis 50 1/2
Duplex (Wood Track)... dis 50 1/2
Terry's Patent... dis 50 1/2
Cronk's Patent... No. 4, 1 1/2; No. 5, 1 1/2; No. 6, 1 1/2... dis 50 1/2
Wood Track, Iron Clad... dis 50 1/2
Carrier Steel Anti-Friction... dis 50 1/2
Architect... dis 50 1/2
Eclipse... dis 50 1/2
Felix... dis 50 1/2
Richards... dis 50 1/2
Lane's Steel Anti-Friction... dis 50 1/2
The Ball Bearing Door Hanger... dis 50 1/2
Warner's Patent... dis 50 1/2
Stearns' Anti-Friction... dis 50 1/2
Stearns' Challenge... dis 50 1/2
Faultless... dis 50 1/2
American... dis 50 1/2
Rider & Wooster, No. 1, 6 1/2; No. 2, 7 1/2... dis 50 1/2
Paragon, Nos. 1, 3 and 5... dis 50 1/2
Paragon, Nos. 5, 6 1/2, 7 and 8... dis 50 1/2
Crescent... dis 50 1/2
Nickel Cast Iron... dis 50 1/2
Nickel Malleable Iron and Steel... dis 50 1/2
Scranton Anti-Friction Single Strap... dis 50 1/2
Scranton Anti-Friction Double Strap... dis 50 1/2
Universal Anti-Friction... dis 50 1/2
Wild West, 4 in. wheel, 1 1/2; 5 in. wheel, 2 1/2... dis 50 1/2
Harnes Snaps—See Snaps.
Hatchets.—List Jan. 1, 1888.
Isaiah Blood... dis 35 1/2
Hunt's Shingling Lath and Claw... dis 40 1/2
Hunt's Broad... dis 40 1/2
Buffalo Hammer Co... dis 40 1/2
Hurd's... dis 40 1/2
Fayette R. Plumb... dis 40 1/2
Wm. Mann, Jr. & Co... dis 40 1/2
Underhill Edge Tool Co... dis 40 1/2
Underhill's Haines and Bright goods... dis 33 1/2
C. Hammond & Son... dis 40 1/2
Simmons... dis 40 1/2
Peck's... dis 40 1/2
Kelly's... dis 40 1/2
Sargent & Co... dis 40 1/2
Ten Eyck Edge Tool Co... dis 40 1/2
Collins, following list... dis 10 1/2
Shingling, Nos. 1, 2, 3... dis 50 1/2
Claw, Nos. 1, 2, 3... dis 50 1/2
Lathing, Nos. 1, 2, 3... dis 50 1/2
Hay Knives...
Lightning—Mfrs. price dis 35 1/2, dis 25 1/2
Jobber's Extras
Electric... dis 35 1/2
Gem... dis 35 1/2
Wadsworth's... dis 40 1/2
Carter's Needle... dis 35 1/2
Heath's... dis 35 1/2
Hinges—
Wrought Iron Hinges—
Strap and T... dis 70 1/2
Screw Hook and... dis 35 1/2
Strap... dis 35 1/2
Heavy Welded Hook... dis 35 1/2
Screw Hook and Eye... dis 35 1/2
Rolled Blind Hinges, Nos. 32 and 34... dis 50 1/2
Rolled Blind Hinges, Nos. 222 and 224... dis 50 1/2
Rolled Plate... dis 70 1/2
Plate Hinges, 1 1/2, 1 3/4 and 2 in... dis 50 1/2
"Providence" over 12 in... dis 50 1/2
Spring Hinges—
Geer's Spring and Blank Butts... dis 40 1/2
Union Spring Hinge Co's list, March, 1888... dis 30 1/2
Acme and U. S... dis 30 1/2
Empire and Crown... dis 30 1/2
Hero and Monarch... dis 30 1/2
American, Gem, and Star, Japanned... dis 30 1/2
American, Gem, and Star, Bronzed... dis 30 1/2
Oxford, Bronze and Brass... dis 30 1/2
Barker's Double Acting... dis 30 1/2
Union Mfg. Co... dis 30 1/2
Bommer's... dis 30 1/2
Buckman's... dis 30 1/2
Chicago... dis 30 1/2
Gate Hinges—
Western... dis 40 1/2
N. E... dis 40 1/2
N. E. Reversible... dis 40 1/2
Clark's, Nos. 1, 2, 3, 4 and 5... dis 40 1/2
N. Y. State... dis 40 1/2
Automatic... dis 40 1/2
Common Sense... dis 40 1/2
Seymour's... dis 40 1/2
Shepard's... dis 40 1/2
Reed's Latch and hinges... dis 40 1/2
Blind Hinges—
Parker... dis 40 1/2
Palmer... dis 40 1/2
Seymour... dis 40 1/2
Nicholson... dis 40 1/2
Huffer... dis 40 1/2
Clark's, Nos. 1, 2, 3, 4 and 5... dis 40 1/2
Clark's Mortise Gravity... dis 40 1/2
Sargent's, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13... dis 40 1/2
Sargent's, No. 12... dis 40 1/2
Reading's Gravity... dis 40 1/2
Shepard's Noiseless Niagara, Buffalo, Champion... dis 40 1/2
Steamboat, Clark's Old Pattern and Clark's Tip Pattern... dis 40 1/2
Shepard's O. S. Lull & Porter... dis 40 1/2
Shepard's O. S. Lull & Porter... dis 40 1/2
Shepard's Queen City Reversible... dis 40 1/2
Clark's Lull & Porter, Nos. 9, 1, 1 1/2, 2, 2 1/2... dis 40 1/2
North's Automatic Blind Fixtures, No. 2, for Wood, 10 1/2; No. 3, for Brick, 12 1/2... dis 40 1/2
Hoes—
Garden, Mortar, &c... dis 40 1/2
Planter's, Cotton, &c... dis 40 1/2
Warren Hoe... dis 40 1/2
Magic... dis 40 1/2
D. & H. Scovill... dis 40 1/2
Lane's Crescent Scovill Pattern... dis 40 1/2
Lane's Crescent Planter Pattern... dis 40 1/2
Lane's Razor Blade, Scovill Pattern... dis 40 1/2
Maynard... dis 40 1/2
Sandusky Tool Co... dis 40 1/2
Hubbard & Co... dis 40 1/2
Bare... dis 40 1/2
Grab... dis 40 1/2
Hoe Ringers—
Hill's Improved Ringers... dis 40 1/2
Hill's Old Style Ringers... dis 40 1/2
Hill's Tongue... dis 40 1/2
Hill's Ringers... dis 40 1/2
Perfect Ringers... dis 40 1/2
Perfect Ringers... dis 40 1/2

Hair's Hog Rings... dis 20 1/2
Hog Rings... dis 20 1/2
Champion Rings... dis 20 1/2
Champion Rings, Double... dis 20 1/2
Brown's Rings... dis 20 1/2
Brown's Rings... dis 20 1/2
Holding Apparatus—
"Moore's" Hand Rot and Lock Brake... dis 20 1/2
"Moore's" Differential Pulley Block... dis 20 1/2
Holders, File and Tool... dis 20 1/2
Rais Pat... dis 20 1/2
Nicholson File Holders... dis 20 1/2
Hollow-Ware—
Iron—
Stove Hollow-Ware, Ground... dis 70 1/2
Stove Hollow-Ware, Unground... dis 70 1/2
Kneaded and Tinned Hollow-Ware... dis 70 1/2
Oval Boilers, Saucepans & Gine Pots... dis 70 1/2
Gray Enamelled Ware... dis 70 1/2
Agate and Granite Ware... dis 70 1/2
Rustless Hollow-Ware... dis 70 1/2
Galvanized Tea-Kettles—
Each... dis 70 1/2
Silver Plated—1 mo. or 5 1/2 cash in 30 days.
Reed & Barton... dis 70 1/2
Meriden Britannia Co... dis 70 1/2
Simpson, Hall, Miller & Co... dis 70 1/2
Rogers & Brother... dis 70 1/2
Hartford Silver Plate Co... dis 70 1/2
William Rogers Mfg. Co... dis 70 1/2
Hooks—
Cost Iron—
Bird Cage, Sargent's list... dis 70 1/2
Bird Cage, Reading... dis 70 1/2
Clothes Line, Sargent's list... dis 70 1/2
Clothes Line, Reading... dis 70 1/2
Ceiling, Sargent's list... dis 70 1/2
Harnes, Reading list... dis 70 1/2
Coat and Hat, Sargent's list... dis 70 1/2
Coat and Hat, Reading... dis 70 1/2
Frought Iron—
Cotton... dis 70 1/2
Cotton Pat. (N. Y. Mallet & Handle Wks)... dis 70 1/2
Tassel and Picture (T. & S. Mfg. Co)... dis 70 1/2
Wrought Staples, Hooks, &c... dis 70 1/2
Bench Hooks... dis 70 1/2
Wire—
Wire Coat and Hat, Gem, list April, 1888... dis 70 1/2
Wire Coat and Hat, Miles, list April, 1888... dis 70 1/2
Indestructible Coat and Hat... dis 70 1/2
Wire Coat and Hat, Standard... dis 70 1/2
Belt... dis 70 1/2
Grass... dis 70 1/2
Brush... dis 70 1/2
Whitcomb Patent... dis 70 1/2
Hooks and Eyes—Malleable Iron... dis 70 1/2
Hooks and Eyes—Brass... dis 70 1/2
Fish Hooks, American... dis 70 1/2
Horse Nails—
Nos. 6, 7, 8, 9, 10
Anable... dis 70 1/2
Clinton, Fin... dis 70 1/2
Lytle... dis 70 1/2
Snowden... dis 70 1/2
Putnam... dis 70 1/2
Vulcan... dis 70 1/2
Northwestern... dis 70 1/2
Globe... dis 70 1/2
C. C. Co... dis 70 1/2
B. K. E... dis 70 1/2
Champion... dis 70 1/2
New Haven... dis 70 1/2
Saranac... dis 70 1/2
Champion... dis 70 1/2
Capewell... dis 70 1/2
Star... dis 70 1/2
Anchor... dis 70 1/2
Western... dis 70 1/2
Empire Bronzed... dis 70 1/2
Horse Shoes—See Shoes, Horse.
Hose, Rubber, competition... dis 70 1/2
Standard... dis 70 1/2
Extra... dis 70 1/2
N. Y. R. & P. Co., Para... dis 70 1/2
N. Y. R. & P. Co., Extra... dis 70 1/2
N. Y. R. & P. Co., Dundee... dis 70 1/2
Huskers—
Blair's Adjustable... dis 70 1/2
Blair's Adjustable Clipper... dis 70 1/2
Ice Picks, Chisels, &c—
National Ice Chisel Pat'd... dis 70 1/2
Ice Chisel... dis 70 1/2
Nove's Ice Breakers... dis 70 1/2
Dunlap's Ring Picks... dis 70 1/2
Wood Head Picks, Sargent's... dis 70 1/2
Iron Head Picks, Sargent's... dis 70 1/2
Ice Mallets, Pick in handle... dis 70 1/2
Ice Axes, Small Cast or Mail... dis 70 1/2
Combination Ice Tools... dis 70 1/2
Acme Ice Pick and Tongue... dis 70 1/2
Rogers' Lightning Ice Chisel... dis 70 1/2
Ice Tongs—
Champion, S. S. & Co... dis 70 1/2
Family... dis 70 1/2
Jack Screws—See Screws.
Kettles—
Brass, 7 to 17 in... dis 70 1/2
Brass larger than 17 inches... dis 70 1/2
Enamelled and Tea Kettles... dis 70 1/2
Keys—
Lock Ass'n list Dec. 30, 1888... dis 70 1/2
Eagle, Cabinet, Trunk and Padlock... dis 70 1/2
Hotchkiss' Brass Blanks... dis 70 1/2
Hotchkiss' Copper and Tinned... dis 70 1/2
Hotchkiss' Padlock and Cabinet... dis 70 1/2
Ratchet Bed Keys... dis 70 1/2
Knife Sharpeners—
Park's Applewood Handles... dis 70 1/2
Park's Rosewood or Cocobolo... dis 70 1/2
Knives—
Wilson's Butcher Knives... dis 70 1/2
Ames' Butcher Knives... dis 70 1/2
Nichols' Butcher Knives... dis 70 1/2
Ames' Shoe Knives... dis 70 1/2
Ames' Bread Knives... dis 70 1/2
Ames' Shoe and Bread Knives... dis 70 1/2
Hay and Straw... dis 70 1/2
Table and Pocket... dis 70 1/2
Knobs—
Door Mineral... dis 70 1/2
Door Por. Jap'd... dis 70 1/2
Door Por. Nickel... dis 70 1/2
Door Por. Plated... dis 70 1/2
Drawer, Porcelain... dis 70 1/2
Remacite Door Knobs, new list... dis 70 1/2
Yale & Towne Wood Knobs, list Dec. 1885... dis 70 1/2
Furniture Main... dis 70 1/2
Furniture Wood Screws... dis 70 1/2
Base, Rubber Tip... dis 70 1/2
Picture, Judd's... dis 70 1/2
Picture, Sargent's... dis 70 1/2
Picture, Remacite... dis 70 1/2
Shutter, Porcelain... dis 70 1/2
Carriage, Japanned... dis 70 1/2

Ladies—
Melting, Sargent's... dis 50 1/2
Melting, Reading... dis 50 1/2
Melting, Monroe's Patent... dis 50 1/2
Melting, P. S. & W... dis 50 1/2
Melting, Warner's... dis 50 1/2
Lawn Mowers—
Standard list... dis 50 1/2
Enterprise... dis 50 1/2
Lanterns—
Tubular, Plain, with Guards... dis 50 1/2
Tubular, Lift Wire, with Guards... dis 50 1/2
Tubular, Square Plain, with Guards... dis 50 1/2
Tubular, Sq Lift Wire, with Guards... dis 50 1/2
Without Guards, 2 1/2 dozen less.
Police, small, 50 00; Med. 75 00; Large, 90 00... dis 50 1/2
Lemon Squeezers—
Porcelain Lined, No. 1... dis 50 1/2
Wood, No. 2... dis 50 1/2
Wood, Common... dis 50 1/2
Dunlap's Improved... dis 50 1/2
Sammis... No. 1, 50; No. 2, 50; No. 3, 50... dis 50 1/2
Jennings' Star... dis 50 1/2
The "Boss"... dis 50 1/2
Dean's... dis 50 1/2
Little Giant... dis 50 1/2
King... dis 50 1/2
Lines—
Cotton and Linen Fish, Drapers... dis 50 1/2
Draper's Chalk... dis 50 1/2
Draper's Mason's Linen, 34 ft., No. 1, 1 1/2; No. 2, 1 1/2; No. 3, 1 1/2; No. 4, 1 1/2; No. 5, 1 1/2... dis 50 1/2
Cotton, Cotton, No. 4, 3 1/2; No. 5, 3 1/2; No. 6, 3 1/2... dis 50 1/2
Silver Lake, Braided, Nos. 0, 50 00; No. 1, 50 00; No. 2, 50 00; No. 3, 50 00... dis 50 1/2
Mason's Linen, No. 3 1/2, 1 1/2; No. 4, 1 1/2; No. 5, 1 1/2... dis 50 1/2
Mason's Colored Cotton... dis 50 1/2
Vest Clothes, No. 18, 35 00; No. 19, 35 00; No. 20, 35 00... dis 50 1/2
Vest Cord, 1/2 in. Braided, White or Drab... dis 50 1/2
Cotton... 75 00; 50 00; 35 00... dis 50 1/2
Locks, Padlocks, Cabinet Locks, &c—
List Dec. 30, '86, chgd Feb. 2, '87... dis 50 1/2
Note—Lower net prices often made.
Mallory, Wheeler Co, list July, 1888... dis 50 1/2
Sargent & Co, list Feb. 1, 1888... dis 50 1/2
Reading Hardware Co, list Feb. 2, '88... dis 50 1/2
Livingston & Co... dis 50 1/2
Perkins' Burglar Proof... dis 50 1/2
Plate... dis 50 1/2
F. Many's "Extension Cylinder"... dis 50 1/2
Barnes Mfg. Co... dis 50 1/2
Yale Corrugated Key... dis 50 1/2
Diets Flat Key... dis 50 1/2
L. & C. Round Key Latches... dis 50 1/2
L. & C. Flat Key Latches... dis 50 1/2
Romer's Night Latches... dis 50 1/2
Yale new list... dis 50 1/2
"Shepardson" or "U. S."... dis 50 1/2
"Felter" or "American"... dis 50 1/2
Seed's N. Y. Hasp Lock... dis 50 1/2
Cabinets—
Eagle, Gaylord Parker and list March, '88, revised... dis 50 1/2
Corbin... dis 50 1/2
Delta, Nos. 38 to 39... dis 50 1/2
Delta, Nos. 51 to 53... dis 50 1/2
Delta, Nos. 55 to 56... dis 50 1/2
Stoddard Lock Co... dis 50 1/2
Champion's Night Latches... dis 50 1/2
Barnes Mfg. Co... dis 50 1/2
Eagle and Corbin Trunk... dis 50 1/2
Champion's Cabinet and Combination... dis 50 1/2
Yale... dis 50 1/2
Romer's... dis 50 1/2
Adlocks—
List Dec. 23, '84... dis 70 1/2
Yale Lock Mfg. Co... dis 70 1/2
Eagle... dis 70 1/2
Eureka, Eagle Lock Co... dis 70 1/2
Romer's, Nos. 0 to 91... dis 70 1/2
Romer's Scandinavian, &c, Nos. 100 to 508... dis 70 1/2
E. Dietz... dis 70 1/2
"Champion" Padlocks... dis 70 1/2
Hotchkiss... dis 70 1/2
"Star"... dis 70 1/2
"Horse Shoe"... dis 70 1/2
Sargent Mfg. Co... dis 70 1/2
Nock's... dis 70 1/2
Brown's Patent... dis 70 1/2
Scandinavian... dis 70 1/2
Pratt's Pat. Scandinavian new list (low)... dis 70 1/2
Lumber Tools—
Ring Peavies, "Blue Line" Finish... dis 70 1/2
Ring Peavies, Common Finish... dis 70 1/2
Steel Socket Peavies... dis 70 1/2
Mail, Iron Socket Peavies... dis 70 1/2
Cast Hooks, "Blue Line" Finish... dis 70 1/2
Cast Hooks, Common Finish... dis 70 1/2
Cast Hooks, Mail, Socket Clasp, "Blue Line" Finish... dis 70 1/2
Cast Hooks, Mail, Socket Clasp Common Finish... dis 70 1/2
Cast Hooks, Clip Clasp, "Blue Line" Fin... dis 70 1/2
Cast Hooks, Clip Clasp, Common Finish... dis 70 1/2
Hand Spikes... dis 70 1/2
Pike Poles, Pike & Hook, 12 ft., 16 ft., 18 ft., 20 ft... dis 70 1/2
Pike Poles, Pike only... dis 70 1/2
Pike Poles, not ironed... dis 70 1/2
Testing Poles... dis 70 1/2
Wamp Hooks... dis 70 1/2
Landing Blocks... dis 70 1/2
Skidding Tongue... dis 70 1/2
Banded Boot Calks, 1 to 3 M, dis 25 1/2; 5 to 10 M, dis 30 1/2
Square Steel Boot Calks... dis 70 1/2
Chain Rafting Dogs... dis 70 1/2
Ring Rafting Dogs... 100, med., 10 00; large, 12 00
Fiber Grapples... dis 70 1/2
Lustra—
Four-ounce Bottles... dis 70 1/2
Mallets—
Hickory... dis 70 1/2
Gumvite... dis 70 1/2
B. & L. Block Co, Hickory and L. V... dis 70 1/2
Match Safes—
Danglefield's Self-Igniting... dis 70 1/2
Mattacks—Regular list... dis 70 1/2
Meat Cutters—
Dixon's—Nos. 1, 2, 3, 4... dis 70 1/2
Woodcut's... dis 70 1/2
Champion... dis 70 1/2
Hales' Pattern Nos. 11, 12, 13... dis 70 1/2
American... dis 70 1/2
Enterprise... dis 70 1/2

Screw Driver Bits.—Screw Drivers Bits, Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838

